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B 434746











695 £5

GENERAL VIEW
OF THE
AGRICULTURE
OF THE
COUNTY OF DUMFRIES:
WITH
OBSERVATIONS ON THE MEANS OF ITS IMPROVEMENT.

BY
BRYCE JOHNSTON, D. D.
MINISTER AT HOLYWOOD.

DRAWN UP FOR THE CONSIDERATION OF THE BOARD OF AGRICULTURE
AND INTERNAL IMPROVEMENT.

LONDON:

PRINTED BY T. WRIGHT.

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1794

[ENTERED AT STATIONERS-HALL.]

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TO THE READER.

IT is requested, that this Paper may be returned to the Board of Agriculture, at its Office in London, with any additional remarks and observations, which may occur on the perusal, *written on the margin*, as soon as may be convenient.

It is hardly necessary to add, that the Board does not consider itself responsible for any fact or observation contained in this Report, which, at present, is printed and circulated for the purpose merely of procuring farther information respecting the Husbandry of this district, and to enable every one to contribute his mite to the improvement of the country.

The Board has adopted the same plan, in regard to all the other Counties in the United Kingdom; and will be happy to give every assistance in its power, to any person, who may be desirous of improving his breed of cattle, sheep, &c. or of trying any useful experiment in husbandry.

LONDON, JUNE, 1794.



INTRODUCTION.

AGRICULTURE is a science of the greatest utility to the individual and to Society. The study and practice of it employ, enlarge, and delight, the intellectual and the active powers of man. By Agriculture, the face of the country is enriched and beautified; the climate is rendered more mild; and the necessaries, the conveniences, and comforts of life are procured, increased, and secured, for the benefit of the husbandman and of the kingdom.

THE high cultivation of any country, under Providence, secures it against famine; greatly increases its population; renders it, in a great measure, independent on other nations; and draws unto it the silver, gold, and precious stones, of other states, for the surplus of food and raiment which it can spare. It employs a great proportion of the inhabitants in a way the most conducive to their own health and strength, and to the good order and peace of the country. The uniform fact, that a mere farming county is always the most healthful, peaceable, orderly, and loyal district in the neighbourhood, flows from principles in agriculture as uniform as the fact itself.

THIS kingdom is capable of much improvement; and in many parts needs it much. In many parts of it, the soil and climate are very favourable for agriculture; the means of improvement are in plenty and near; and good markets are, almost everywhere, at hand, for disposing of the produce. By full improvement of the land, the rental, the population, and the produce of the kingdom may be tripled.

A.

HITHERTO.

HITHERTO, Agriculture hath not made the progress that it ought to have done, because it was not attended to as a *great national object*. It was in the hands of two sets of men, in the situation and habits of each of whom, in general, there is something unfriendly to its progress. First, The common country farmers, whose limited education, contracted habits of life, and narrow fortunes, confined their farming operations to local customs, whether they were good or bad. Until within these last thirty years, the farmers in most of the counties in Britain went on as their fathers had gone before them for time immemorial. They were equally ignorant of any new mode of improvement, and averse to risk a single pound in making the experiment.

AND, secondly, Country Gentlemen, who, from their situation and habits of life, are ignorant of, and inattentive to, the minutia and economy of farming, become a prey to designing or idle servants, and thereby expend more money upon the working of their farms than the value of the returns which they receive from them. Many of them have thus enriched their farms, and impoverished themselves. In this way they have discouraged themselves, and also the common farmers. These, when shewn the improvements made by gentlemen, uniformly said, “ They could not afford “ to make such improvements ; these are fit for the landlord only, who “ pays no rent.”

In both these orders of farmers, there have long been several individuals who have shone forth as uncommon phenomena in the midst of the general darkness that surrounded them. But their number and influence were not sufficient fully to correct the two opposite evils which retarded the progress of Agriculture.

BUT now the time is come, when *Agriculture* is marked with that dignity, as a *great national object*, which corresponds to its own nature and utility.

BY A SOVEREIGN who is, indeed, *the Father of his People*, and who himself hath set an illustrious example of *farming* to all his subjects, it hath received a *Royal Approbation*, which cannot fail to make a *taste* for *farming* subservient to the progress of *Agriculture*, and to the great and permanent interests of the kingdom.

UNDER the direction, assistance, and patronage, of the Honourable BOARD OF AGRICULTURE, made up of so many patriotic Noblemen and Gentlemen, at once so able and so willing to gratify their Sovereign in serving their country, we may justly entertain the most sanguine hopes of the progress of *Agriculture*; and that Britain shall become as distinguished for the cultivation of her soil, the fulness of her granaries, the virtue, the industry, the good order and prosperity of her inhabitants, under the reign of our illustrious Sovereign, as she hath long been for *her admirable Constitution of Civil Government*.

IN the following sheets, I have given a general account of the COUNTY OF DUMFRIES, in SCOTLAND, and of the state of *Agriculture* in it, with the obstacles to the improvement of the country, and the most probable methods of removing them. I have interspersed that account with observations on the leading principles of *Agriculture*, and on the manner of putting them in practice; and I have closed them with some general observations relative to the improvement and good government of men, as individuals, and as connected in Society.

If what I have written shall meet the approbation of my native County, and of the Honourable BOARD OF AGRICULTURE; if it shall promote the cultivation of the kingdom, and the virtue, good order, and prosperity of my countrymen; or if it shall excite any more able hand to attempt and attain these important objects, I shall obtain the ends for which I have written the following paper.

Holywood, 11th November 1794.

BRYCE JOHNSTON.



GENERAL VIEW, &c.

SITUATION, EXTENT, SOIL, AND CLIMATE.

THE COUNTY OF DUMFRIES is situated nearly between $54^{\circ} 48'$ and $55^{\circ} 28'$ north latitude, and $2^{\circ} 15'$ and $3^{\circ} 30'$ longitude, west of London. It is about forty-four miles long from south-east to north-west, and about thirty-four broad from north-east to south-west. There is no map of the county. As a considerable number of the noblemen and gentlemen of the county have subscribed for copies of a map which a land-surveyor of character intends to draw, it is hoped that a sufficient number of copies will be subscribed for, and the map will soon be completed and published. But supposing the mean length to be forty-two miles, and the mean breadth thirty-two, there will be 1344 square miles, which will make about 672,000 Scottish acres of land in the county, or nearly a fifth part more English acres. It is bounded on the east by Selkirkshire, Roxburghshire, and Cumberland, in South Britain; on the south by Solway Frith and the Stewartry of Kircudbright; on the west by that part of the Stewartry called The Glenkens, and the shire of Ayr; and on the north by Lanerkshire, Clydesdale, and Tweedale.

The three large rivers of Esk, Annan, and Nith, divide it into three great districts, to which they give *their* names. The eastmost is called Eskdale, the middle one Annandale, and the westmost Nithsdale. In nearly parallel lines, with some small curvings, these rivers, at about twelve miles distance from each

each other, run from the north side of the county into the Solway Frith. The town of Annan stands on the banks of the Annan, near the foot of it, and Dumfries, the head town of the county, on the banks of the Nith, at the distance of a few miles from the Frith. Besides these three large rivers, there are many smaller ones in the county : Sark, which, for a considerable distance from its mouth upwards, is the march between this county and Cumberland, empties itself into the Solway Frith, at a short distance to the east of Graitney-Church ; Kirtle and Locher, which run into the Frith, the former near the west side of the parish of Graitney, and the latter on the march between the parishes of Ruthwald and Carlaverock ; Moffat, Evan, Corrie, Dryfe, Kinnal, Æ , Milk, and Mein, which run into the Annan ; and Mennick, Skarr, Cample, and Cluden, which flow into the Nith ; besides many smaller waters, and large burns or streams. The influx of the tide from the Frith renders Sark, Annan, and Nith, navigable for vessels of considerable burthen for a considerable way up, and thereby the towns of Annan and Dumfries are a kind of sea-ports. This great number of rivers highly ornaments the county, abundantly supplies it with water, furnishes a considerable variety and quantity of fish, and, if manufactories were established, would be of great use for driving machinery, and for other purposes of the manufacturer. The banks of most of them are fully clothed, and beautifully ornamented with natural woods.

The landed property of this county is divided among four peers, seven baronets, many respectable gentlemen of independent fortunes, and a considerable number of proprietors of small estates. Hence, though the four noblemen are possessed of very large estates, the roll of freeholders is considerable, and that of commissioners of supply (or land tax) for the county is very large. They are a body of men equally attached to
loyalty

loyalty and patriotism, to liberty and the peace and good order of society. The greater part of the private gentlemen of considerable estates, and of the small proprietors, reside in the county ; and many of them, with a public spirit that does them credit, are zealous, active, and successful, in promoting its interest and improvement.

In this county there are the royal burghs of Dumfries, Annan, Lochmaben, and Sanquhar ; the first and last of these are situated in the Nithsdale, and the other two in the Annandale district. These four, with the royal burgh of Kircudbright, in the stewartry of that name, send a member to parliament. There are also the country towns or large villages of Langholm in Eskdale ; of Ecclefechan, Lockerbie, and Muffat, in Annandale (the last of these is a very good watering-place) ; and of Thornhill and Minihive in Nithsdale ; besides many smaller ones. Markets and fairs, at stated times, are held in all these burghs and large villages. These are most frequent, as well as most considerable, in Ecclefechan and Lockerbie, Dumfries only excepted, which is, by far, the principal market-town, as it is the head-town of the county. Every Wednesday through the year, there is a constant weekly market in Dumfries for meal, corns, potatoes, butchers meat, fish, poultry, eggs, coals, and sundry other articles. Saturday is also a market-day for butchers meat, fish, potatoes, and coals. The market for butchers meat hath long been distinguished, as well for the neat, clean, and commodious building, as for the large quantity and good quality of the meat, especially the beef, veal, and lamb, the mutton in general being too young, though abundantly fat. Probably both the graziers in the country, and the inhabitants of Dumfries, and the other consumers of butchers meat, would be much better served if there were more dealers of considerable capital, so as to form a fair competition. Formerly, the corn and meal market was well sup-

plied by respectable farmers in the neighbourhood ; but several years ago, they refused to comply with a very singular and odd custom, with which they had always been much dissatisfied. It is this : *The county-hangman* goes through the market every market-day, with a brass ladle or large spoon, pushes it into the mouth of every sack of meal, corn, &c. and carries off its fill. When the farmers refused any longer to comply with this custom, the matter was tried before the courts of law, and the hangman was found to have right to this perquisite of office. From that time the principal farmers have sent very little meal or corn to the public market. Thus not only the hangman suffers, but the inhabitants of the town also suffer. The poorer sort of them, not able to purchase a large quantity of meal or barley at once, and often unable to find any in the public market, are obliged to buy it from hucksters or small dealers, who since that time have greatly increased in Dumfries, and must have a profit between the farmer and consumer, which all, at last, falls upon the poor tradesman or labourer. Cannot the town and county devise some other less offensive fund for the executioner, as a full compensation for the want of this odd and disagreeable custom ? By doing so, Would they not consult the honour, the police, and the interest of the town ?

But the markets and fairs for horses and black cattle are the principal ones in Dumfries. Large quantities of English, Irish, and Scottish horses, of all kinds and prices, for the saddle and the draught, are sold three times in the year ; at the Candlemas fair, which falls on the 13th of February, if a Wednesday, or, if not, on the first Wednesday after the 13th ; on the first Wednesday of July, being the day after the great horse-fair at Kelton-hill, in the stewartry of Kircudbright ; and at the Rood fair, which is held on the 25th of September, if a Wednesday, or, if not, on the first Wednesday after the 25th.

Each.

Each of these two fairs continues a week, in so far as certain privileges of erecting tents for selling articles of merchandize on the street are allowed to those who are not freemen of the town. Horses are sold on the Tuesday, Wednesday, and Thursday, but chiefly on the Wednesday. There is a very considerable market for black cattle every Wednesday from the first Wednesday of April to the last of December every year. During these nine months a great number of cattle is shewn and sold. It is not easy to ascertain it exactly; but from a general calculation it appears to be considerably above twenty thousand. There are two market-days, about the middle of October, on which a very large quantity, especially of aged cattle fit for the markets in the south of England, is shewn in the market-place, and in the parks in the neighbourhood, sometimes to the amount of four thousand on one day. These days are called *Hempton Wednesdays*, because the cattle bought on them suit the fair of *Hempton-Green*, in the south of England, both in point of quality and time. On the first and second Wednesdays after Martinmas (the 22d of Nov.) a large quantity of fat cattle, ready for the knife, are sold to supply private families with their winter beef, as well as to serve the butchers at that time of general slaughter. The first of these days, called *Martinmas Wednesday*, is the greatest market for fat cattle, and falls on Martinmas Day, when the 22d of November is a Wednesday. The cattle that are sold on the other market-days during the above nine months in the year, are generally milch cows, young cattle, and lean cattle for fattening. A considerable number of these is bought by small cattle dealers, mostly for ready money, who drive them to Carlisle market every Saturday, and to several other markets and fairs in the north of England; and the remainder is bought by the gentlemen and farmers in this county and the stewartry of Kircudbright, to supply the place of the aged cattle

which they sell to the south drovers. All the cattle sold in Dumfries markets are not bred or fed in this county ; many of them are brought from the stewartry of Kircudbright, and several from the shires of Ayr and of Wigton, from the Highlands of Scotland, and from Ireland.

In a county so extensive, and in many of its parts, so various in situation and elevation, the soils and climates must be various. A large tract of high mountains, on the north side of the county, runs the whole length of it, from east to west, across the heads of the three great rivers. These make up more than one third part of the county in point of extent. Though many of the mountains have particular names, to enumerate which would be equally tedious and useless, the whole great range is known by the Eskdale Hills, the Annandale Hills, and the Nithsdale Hills ; names taken from the three great rivers which, issuing from them, descend through the southern vale or *dale* to the Solway Frith, the other extremity of the county. These mountains exhibit an internal, or rather an external proof, that they are the highest range between the Friths of Forth and Solway. For on one of the Annandale Hills, very near the middle of the range, measuring from east to west, the river of Annan rises in its south-side, and runs south to the Solway Frith ; the river of Clyde in its north-west side, and runs north-west to the Clyde Frith ; and the river of Tweed in its north-east side, and runs north-east to the German Ocean at Berwick. Thus the rise, the course, and the termination, of these three large rivers fully prove, that the land falls in every direction from the centre of that range of mountains to the sea. So distant from the sea on every side, and so high above it, the soil and climate of these mountains are very cold, and at different seasons much exposed to great falls of rain and storms of snow and frost. The Eskdale Hills are all covered with a strong coarse green grass,

and

and the Annandale and Nithsdale Hills with the same kind of grass, but not so strong, and in some parts interspersed with heath.

On the sides of each of the rivers of Esk, Annan, and Nith, there is a beautiful *dale* or valley, narrow at the head, gradually widening as it runs toward the south; which three valleys, before they reach the middle of the county, unite into one extensive, beautiful, grand, and rich plain, which extends the whole length of the county, from east to west, on its south side, crossing the lower parts of these rivers. Though this plain hath very few hills in it, yet, on account of several gentle risings, it is not that dead level which, by the extent and uniformity of the prospect, at once fatigues and stupifies both the eye and the mind of the traveller; but it is rather a beautiful assemblage of many small valleys, separated from one another by such gentle risings as forms one great plain, which the traveller can see only part after part, with all the pleasure of uniformity and variety, and of vastness and distinctness united. From the low and nearly level situation, from the great extent, and from the contiguity of the valley to the Solway Frith, and from the height of the circle of mountains which surrounds it on every side, the climate is very temperate and mild; there is not too much rain near the centre, though it is rather too wet nearer the skirts of the valley; and the frosts and snows are commonly of very short continuance. Besides the high hills on the north, this plain is completely sheltered by a range of very high hills on the other sides in the stewartry of Kircudbright, and in Cumberland on the opposite side of the Solway Frith. Along the sides of all these rivers, to a considerable wideness, the soil is a rich, deep, kindly loam, of a brownish colour, commonly called *holland*. Though the other two rivers continue in this county until they lose themselves in the Frith, the Esk enters Cumberland a considerable distance

from

from its mouth. At a considerable distance from each river, in the intermediate space, the soil is not so deep, mellow, and free from stones. In Eskdale and Annandale, it is generally cold and wet, lying on a bed of till or clay; and in Nithsdale, it is generally warm, dry, and kindly, lying upon a bed of sandy gravel. But in some parts, the cold soil and bed are to be found in the dry and warm district, and the warm soil and bed in the cold district.

THE MANNER IN WHICH THE LAND IS OCCUPIED AND EMPLOYED, &c.

THE land is occupied partly by some of the proprietors themselves, but principally by tenants. *Gentlemen's seats*, with the buildings, plantings, and other parts of their pleasure-grounds, erected and laid out with taste, elegance, conveniency, and, in some instances, with grandeur, are very frequent in this county, especially on each side of the Nith. The farms are of all sizes, from very small to very large ones. In general, they are much larger in Nithsdale than in Eskdale and Annandale. For this there is a good natural reason. In the greatest part of these two latter districts, the soil is so wet, and when ploughed early in winter so apt to run into grafts, and thereby to choak the corn which is sown upon it in the spring, that it is neither practicable nor prudent to give the *seed furrow* to much of that land in winter. But the dry light land in Nithsdale is capable of being ploughed, through the whole winter, excepting only in frost and snow, and is much fitter for receiving the *seed furrow* early. Hence one plough on a farm in Nithsdale will plough, through the year, nearly as much ground as two will do in the wet parts of the county.

The

The range of high mountains through the whole north side of the county, is employed, as nature directs, in pasture, and is stocked partly with black cattle, but principally with sheep. The Eskdale Hills are stocked with a very good kind of large sheep, with fine wool, all white, face and legs included, much resembling the sheep upon the *Tiviot Hills*; and the Annandale and Nithsdale Hills mostly with the common hardy Scottish sheep, with black faces and legs, and long coarse wool. Many of these hardy sheep have a fine short close fleece of wool. By proper attention to keep for *breeders* only, those ram and ewe lambs which have such fleeces, in process of time the quality of the wool might be greatly improven, and the same hardy and useful race of sheep still preserved on their native stormy mountains. Some small vallies among these mountains are cultivated, and produce oats, potatoes, and bear (an inferior kind of barley), none of them of the best quality, nor in such quantities as to supply the few inhabitants of that thinly-peopled district.

The extensive plain in the southern part of the county is employed, partly in agriculture, and partly in pasture. The sown grasses are rye-grass, rib-grass, red, white, and yellow clovers, mixed together, of such kinds, and in such proportions, as correspond to the nature of the soil on which they are sown, and the length of time it is intended to lie in grass. Here there are a few sheep chiefly of the English breeds, originally introduced by *CULLEY* and by *BAKEWELL*. They both succeed: the latter are the better; but a mixed breed of both is the best. The sheep are large, more easily kept in parks than the small ones, and their fleece of wool is large, close, and fine. Of late, some gentlemen have got a few Shetland and Spanish sheep, small, and with exceeding fine, close, short wool. It is hoped they will succeed well here, but there has not yet been sufficient time to ascertain the fact by experiment. It is not easy to ascertain exactly the

the quantity of sheep kept in the whole of this county ; but, upon a general computation, it is believed to be about two hundred thousand.

The black cattle are principally of the *Galloway breed*, especially in the Nithsdale district. In the other two, a considerable proportion are still of the original breeds of these districts. In the middle one they are called the Annandale breed, and in the east one the Eskdale breed. Neither of these are so good as the Galloway breed. Though pretty large, they are too long of the leg, too narrow on the back, and too thin and short of the hair, and in consequence of that shape and coat neither so weighty to their height, nor so hardy, as the Galloway breed. The Galloway breed hath been frequently crossed with bulls brought from different parts of England, but not improven thereby. The true Galloway breed of black cattle, in proportion to their size, is the handsomest and best in Britain, and draws the best price in every market in the kingdom where they are expos'd. When fat for the butcher, their average weight for the four quarters is about thirty-six stone of sixteen pounds each stone. Many of them weigh sixty stone, and some few considerably more. This breed hath a large foot, a short and thick leg, a long, deep, and round body, a straight and broad back, and a thick and shaggy coat of hair. Many Highland cattle, principally bullocks, are brought into this county annually, both from the North and West Highlands. They improve very much in it, and the latter feed to a great weight, sometimes to above thirty-two stone. A considerable number of milch cows, of a small size, but good milkers, are brought from some of the districts of Ayrshire. A great proportion of the Galloway cattle is polled (without horns), and those that are so, especially while young, commonly sell above five *per cent.* higher than those which have horns. The reasons of this additional price are,

that

that they are more hardy, less hurtful by pushing when feeding loose in straw yards, and that the English graziers are more certain that they are of the true Galloway breed, which they hold in high estimation.

Some persons represent the cows of one county or breed, and others those of another, as the best milch ones. But, in fact, there are equally good milch cows of every breed, if men had only the skill to choose and break them properly. It is true, *ceteris paribus*, the largest cows will give the greatest quantity of milk, provided their pasture, in point of rankness, is proportioned to their large size. Hence the large Dutch and English cows are represented as the best milch cows. But this is not a just nor wise mode of calculating or comparing. Those are the best milch cows, which, when fed summer and winter upon the whole produce of a certain farm in a proper state for a dairy, produce the greatest quantity of milk and butter through the whole year. If that farm will feed only twelve large Dutch or English cows, and will feed twenty Scottish cows, and if these twenty Scottish cows produce more butter and milk through the whole year, which in most cases in this country they will do, then these Scottish cows are the best milch ones, because they consume no more food through the year than the twelve large ones, the whole twenty were at first bought in for less money than the whole twelve, are much more hardy in bad climates or seasons, and require less attention in the management of them. The black cattle of every country appear to have been originally of two distinct kinds, and wisely fitted for two distinct purposes; the one for the draught and the other for the dairy. Having been long and frequently crossed with each other, the original shapes of both kinds are much changed, and not so distinct from each other as most probably they once were. But still much of their original and characteristic shapes appears in many individuals

of every country, and to this day points them out as formed for their respective purposes. Those which are fit for the draught have thick necks, broad shoulders, heavy forequarters, thick skins, and strong thick legs. Cows, of whatever country, of this make, never give much milk; but bullocks and heifers of this shape are always powerful and hardy in the plough or wain. But those cows, of every country, are good milch ones which have a small long neck, a slender shoulder, light forequarters, large hindquarters, small legs, a thin skin, large milch veins in the belly, a large udder and teats, but not hanging too low or too loosely from the belly, and, if not polled, very slender horns. Were breeders half as careful to preserve these two kinds of black cattle distinct, and to breed one kind for the draught and the knife, and another for the dairy, as they are in preserving distinct the different kinds of horses, for the *turf*, the *chase*, the *road*, and the *draught*, the buyer would as seldom mistake one of these kinds of cows for another, in the market, as he does the *race-horse* for the *cart-horse*. But these cows need to be broken for their particular purpose as well as horses do, and the milch cow as well as the draught ox. Many cows of the best shapes for milk, are entirely spoiled by the ignorance or carelessness of servants or others in the breaking. The time to break them is the first season they give milk. Some time before they calve, they should be housed and handled, especially about the udder and teats, to make them gentle and willing to give their milk after they have calved. As soon as they drop their first calf, it should be carried out of their sight, it should be fed by another cow, or with milk in a dish, and should never suck its dam. In this way, they will be broken to give their milk freely, and their future calves may suck them till fit to be killed or weaned; and they will not keep up their milk, or *jet*, as the country farmer calls it, when the calf is taken off. For want of this mode of breaking,

ing, many of the best milch cows in every country are entirely spoiled by *peting*. In the above modes the milch cows of my dairy have been bred and broken for many years with much success. It is not easy to ascertain how many black cattle are driven each year from this county to the markets in the south of England, as those of this and the two neighbouring counties of Wigton and Kircudbright are commonly bought and taken to England together by the same drovers. In one year, four of the principal drovers carried to England 130,000 ster. worth of black cattle, which would be nearly 20,000 head. Of these, probably, not above four thousand went from this county.

MANURES, ROTATION OF CROPS, AND GRAINS PRODUCED, &c.

IN several parts of the county, large tracts of land are capable of being watered, and formerly were watered to considerable advantage. But that mode of improvement hath been given up, with great propriety, in all those parts where the much superior manures of marl and lime have been discovered. These much better and more durable manures produce their proper effects only when spread on lands laid quite dry.

The grains, roots, pulse, and other vegetable food produced here are, wheat, barley, oats, rye, bear, peas, beans, potatoes, turnips, and cabbages. The wheat does not fully supply the consumption of the county. A considerable quantity of foreign wheat is imported into it; but the flour and biscuit made from a part of that is sent to neighbouring counties, and some of it out of Scotland. The peas, beans, rye, bear, turnips, and cabbages, are all consumed in the county, and are equal to the

consumption. A very large quantity of barley, oats, oatmeal, and potatoes are exported from the county. These articles are carried to Carlisle and Wigton in Cumberland, to the Glenkens in the stewartry of Kircudbright, to some parts in the shires of Ayr and Lanerk, by land-carriage from the most contiguous parts of the county, and to Greenock, to Liverpool especially, and to other towns in England; by water-carriage, being shipped at the mouth of the Nith, Annan, and Sark, and in some parts on the Solway Frith, all within the limits of the port and custom-house of Dumfries. It is not easy to fix the precise quantity of these that are exported in a year. One corn-factor, on whose information I can perfectly depend, hath already this season bought for exportation 30,000 Winchester bushels of barley, 6,000 Winchester bushels of oats, and 200 tons of potatoes. He is indeed the principal dealer in these articles; but as there are several other corn-factors, the quantity of barley exported from the whole county in one year must be about 90,000 Winchester bushels, 600 tons of potatoes, and in oats and oatmeal about 40,000 Winchester bushels. The grain is mostly sold for ready money. The exportation trade to England is conducted with great propriety. But if the Greenock and other West-country merchants would employ persons of character to buy meal for them in this county, they might often be supplied with that article from this county much to their own interest, when they are importing it from Ireland.

The rotations of crops vary a little in different parts of the county, and in some parts the mode of cropping scarce deserves the name of rotation. With some bad farmers, the only rotation seems to be to crop their lands as long as they can bear a crop at all. But the following is the best and most general rotation in the most cultivated parts upon extensive farms. After opening from pasture, two crops of oats; one

of any green crop, as peas or beans in broad cast, or potatoes or turnips in drills, all with sufficient dunging; one of barley in broad cast, sown down with rye-grafs and clover seeds; two in hay, and four in pasture. This rotation is completed in ten years. Many leave out the green crop, which reduces the rotation to nine years. When begun upon an uncultivated farm, a sufficient quantity of lime or marl is spread on the green surface of the layland, one year, at least, before it is broken up for the first crop of oats. In the second and subsequent courses of the rotation, the land, sufficiently rich, is opened up without any manure. Where the land is naturally strong, or hath been made very rich, wheat is sown after that part of the green crop that was peas, beans, or potatoes, in place of barley, and is also sown down with grass seeds. And where the land is very rich after the four years pasturage, wheat or barley is sometimes sown as a lay crop, with a narrow furrow, in place of the first crop of oats, and generally succeeds well on very rich and mellow land.

The farm-houses should stand as near the *centre* of the farm as possible, to save the time, labour, and expence of carting the dung from and the crops to them. Supposing the farm to contain 150 Scottish acres of arable land, it should be divided into ten parts of fifteen acres each for carrying on this rotation: two of them, or thirty acres, would be annually, in wheat and oats; one, or fifteen acres, in green crop; one, or fifteen acres, in wheat or barley; two, or thirty acres, in cut clover, and rye-grafs and clover hay; and four, or sixty acres, in rich pasture. After the first course of this rotation, two good horses for the plough, and one for the cart, are sufficient to work the whole of this farm. The following qualities form the great excellency of this rotation, and render it equally beneficial to the farmer, to the landlord, and to the country at large. By the *proper division of labour among all*

the months of the year, the farm can be managed by few men and horses ; by *the proportions of stock and crop*, a proper quantity of grain, of pulse, of milk, butter, and cheese, and of beef, are produced ; so that the price of some of these articles rising as that of others of them fall (which in fact is always the case), they, upon the whole, so exactly balance each other, that the annual returns of the farm in money are always nearly the same ; by the production of *a sufficient quantity of dung annually* from the great number of cattle kept on the farm, the best of all manures for land that has been once sufficiently limed or marled, to keep the farm in a rich state, after the first liming, without the expence of labour, time, and money, in importing foreign manures ; by the land *having no need of a red fallow* to pulverise, clean, or impregnate the soil with salubrious salts and oils from the atmosphere ; all these beneficial purposes being effectually served by the green crop, and the length of time the land lies in grass, and by *every part of the farm producing, every year*, not only a valuable crop, either of grain, roots or grass, but one which also prepares the ground for the following crop. On some *small farms*, the Norfolk husbandry is the rotation, *viz.* one year turnip completely dunged, one year barley sown down with red clover, one year clover cut and consumed green, and one year wheat. This four years rotation is a very good one upon a small farm. In this county we have improved upon the Norfolk husbandry, in that we have changed the turnip crop from broadcast to drill.

Red fallow is not very much used ; and where the above rotations are carried on, it is neither necessary nor beneficial. Turnips in the drill husbandry are at once a very complete green fallow, and a valuable crop. Red fallow, or one altogether without a crop, is of use in those counties only where too great a proportion of the land is kept under the plough. By ploughing too great a proportion of land, the labour and consequent

quent expence of a farm is greatly increased, the milk, butter, cheese, young cattle, beef, and dung, are greatly diminished, and the grain is not increased in such proportion as to compensate these losses ; because, under these rotations, each acre produces a larger quantity of grain, and of a much better quality.

Besides the dung produced by the cattle on the farms, by that collected in all the towns, and by some few compost dunghills of rich earth, corrupted vegetables, and lime, a very large quantity of lime is used as a manure in this county. Dunghills should all lie on a dry place, but in such a situation that their own natural sap should not run off from them. Water standing around them prevents the operation of air upon the dung, and thereby its fermentation. Every time compost dunghills are turned, their top, ends, and sides, should be covered with lime or marl, to extract oils and salts from the atmosphere. A large bed of lime-stone runs nearly through the middle of the arable part of this county, for the greatest part of its length, in a diagonal direction from S. E. to N. W. The lime-stone hath been manufactured, for many years, in the east-side of the county on the estates of Springkell, Braes, and Kellhead ; for several years near the middle of it, on the estates of Comlongon and Closeburn ; and for some years nearer the west side of it, on that of Barjarg. There are some other small lime works in the county besides these extensive ones. All the lime produced in these, and also a considerable quantity of shell lime imported from England by water carriage, are used for buildings and manure within the county.

As the *nature* and *proper management* of lime, *as a manure*, is little known in many counties of Scotland, and in several parts of this, and as I have used lime to a great extent for twenty years, chiefly in improving my own land, and have made accurate experiments upon it on a large scale, it may perhaps

perhaps tend to the general progress of agriculture that I here give an account of the nature and mode of the operation of lime as a manure. It is *effete lime*, and not *quick lime*, that is a manure. Not writing for the philosopher only, but also for the peasant, or the practical farmer, who is to benefit himself and his country by the proper application of this manure, I shall not define these terms chemically, but in such a manner as shall be intelligible to the practical farmer, and at the same time not unphilosophic. *Quick lime* is in its perfection when the burned lime-stone, by the application of water, is newly reduced to a fine dry light powder. When this powder is exposed to the free operation of the atmosphere (air in its present state), it gradually removes from the state of *quick lime* to that of *effete*, until it entirely loses its binding quality, and becomes unfit to cement stones together in a building. Whenever lime arrives at this state it is *effete*. Exposure to the free operation of air for a considerable time in any state of it, or for a short time in intense frost, will reduce it to this state. The mason calls it *frost-bitten lime*, and knows well that it is altogether unfit for his purpose of building. That exposure to the air for a considerable time reduces lime to this state, is a fact universally known wherever lime hath been used for building. Here, in passing, it may not be improper to observe, that as it is of advantage to *soar lime*, as the masonry term is, or to mix it up with sand and a small quantity of water a considerable time before it is wrought up again, and used for building, in order to dissolve fully all its particles, it ought to be soured immediately after it is slackened, or dissolved into a fine dry powder by the application of water, and as soon as soured it should be clapped very close together in a large heap with a very smooth surface; that thus kept from the free operation of air upon it, it may be preserved as quick as possible, that from the strength of its binding quality it may take

take *strong-band*, as masons term it. But as the ends for which lime is used, when applied as a cement in building, and as a manure to land, are directly opposite to each other, reason, even before experiment, would lead us to conclude, that the state of lime, when used to accomplish these ends, should be equally opposite. The end in building, is to cement and bind the stones together into a solid wall. *Quick lime*, possessed of its binding quality, must be in the most fit state for accomplishing that end. But the end in manuring land is to ferment and loosen the soil. Of all others, the binding quality would be the most unfit for this purpose. If lime were to bind the soil, or even the sand and small stones mixed with it, instead of operating as a manure, it would as completely lock up all the vegetative qualities of the ground as the intense frost does when it binds the surface unto one solid, hard, and impenetrable mass. For manure, therefore, it must be fit only when, having lost its binding quality, it is become *effete*. This *theory* I have *fully proven* by many experiments on a large scale, every one of which hath exactly corresponded to and confirmed it. It may suffice to mention one of them. Above twelve years ago I purchased from a gentleman above 2000 Winchester bushels of lime, which, in consequence of a law-suit between him and a tenant, had lain in a heap under the open air for several years. At that time I spread the *effete lime* on parts of two different inclosures, and at the same time spread a larger quantity *per acre* of good quick lime of the same kind upon the other parts of these fields of the same kind and quality of soil. And the effect was, that the crop for the first year was greatly better, and for every year since the crops of grain and of grass have been considerably better on those parts of the field on which the *effete lime* was spread.

Farmers all feel and acknowledge, that when new lime (that is, quick lime) is spread on their ground only a short

D time

time before it is ploughed for a crop, the crop receives very little benefit from it for the first year ; that is, as long as it is *quick* it does not operate as a manure, and when spread on the ground in that state, it must have time to become *effete* before it becomes a manure. If lime could be preserved always *quick* it would never enrich any soil. *Quick lime*, though no manure itself, hath a strong power of attracting to itself fine salts, nitrous particles, and oils, from the atmosphere, from corrupted vegetables, and from the earth. Impregnated with these substances, its own original particles lose their cohesive qualities, it becomes effete, gradually discharges itself of these oils, and especially salt and nitre into the soil ; by these highly fermenting it, and renders it more porous, and thus more fit for the free and extensive communication and operation of the air, and of the internal heat and effluvia of the earth, which is, as it were, its natural perspiration. To the operation of these bodies on the soil, that infinitely wise, good, and powerful Being, who makes *grass to grow for cattle, and corn and herbs for the service of man*, hath communicated, and still preserves those fructifying qualities, by the means of which, year after year, he brings food and raiment for man and beast out of his hidden treasure. Such being the nature of lime, and its manner of operation as a manure, we may hence learn the most natural, and therefore the best mode of applying it as such. In general, that is the best mode by which it is rendered the most completely effete in the shortest time. When it is rendered effete before the first crop is sown, impregnated with manures it operates upon the soil as soon as horse-dung, and produces a good crop *even the first year*, and full of manures at the beginning it continues to benefit the succeeding crops for many years. But what is the best mode ? That certainly which, by exposing it most to the free operation of the atmosphere, most speedily and completely impregnates and renders it effete.

All

All land should be laid completely dry, either by open drains, covered drains, or the direction, size, and form of the ridges and furrows, as the nature and situation of the ground directs before lime is spread upon it. Because water, to a very great degree, resists the communication and operation of air. Accordingly, when wet land hath been limed, the lime will be found many years after, lying at the bottom of the furrow or corn soil, not effete, but cemented together by its own binding quality, as a mass of hard mortar, and the wet land, notwithstanding the lime that is in it, produces poor and scanty crops. Old grass ground, or *lay*, as it is called, is in the most fit state for being limed. The lime should be spread as equally on the surface as can be done, at least a year before the ground is ploughed. By being exposed, so long, on the surface to the air, it becomes effete before the first crop is sown, and fastens so completely among the roots of the grass, and on the surface of the soil, that it is not buried in the bottom of the furrow in ploughing. The lay ground should be ploughed with a narrow and shallow furrow, not laid flat, but set on its edge. Each following year the ground should be ploughed gradually deeper, in order to bring the lime near the surface more within the influence of the air, and to bring up new and unexhausted soil; and the last year the ground is in crop, and when it is to be laid down with grass seeds, it should be ploughed as deep as the soil and cattle will permit, in order to bring up as much of the lime, and of new and unexhausted soil, as possible, to the surface, for the air to operate upon all the years it shall lie in hay and pasture. But if the funds and time of the farmer will allow, the lime should be spread on the surface of the grass ground for two or three years before it is ploughed for a crop. In this way, the lime will not only be impregnated to a very high degree by the length of time it hath been exposed to the free operation of the air, but also by the great melioration of

the quantity and quality of the grass, it will pay the farmer a very good interest for his money and labour, for each year that it lies on the unploughed surface. This hath been my own plan; and it hath paid me abundantly.

But sometimes it happens, that a farmer enters to a farm in so bad a state, that there is no old lay ground to be limed, but much ground, that had been in crop for the preceding year or some preceding ones, that greatly needs lime. In this case, the ground, if clean of weeds, may be limed, though poor, after one ploughing, and that, the seed furrow. The lime should be carted, in the preceding summer, and laid in large heaps, on dry places, at the ends of the field. In that state it should lie to be impregnated from the air, especially from that great quantity of nitre of which the frosty air in winter is full, until the spring, when it should be spread equally on the surface of the ploughed but unharrowed ground, one, two, or three weeks before the seed is sown upon it, as the state of the weather, and of the labour of the farm, shall permit. The seed should be sown upon the lime, and they should be harrowed together. In this case, the preceding ploughing should have been deep, to bury any weeds that were in the exhausted soil, and to bring up new sail to the surface; and if grass seeds are not sown with this crop, the ploughing for next crop should be shallow, that the lime may be kept near the surface and the air. But land limed in this state should be laid out to grass, as soon as the general state of the farm shall allow. In grass, it will pay well for the lime, and it will produce good crops when opened up again. But if the land is full of either root or seed weeds, or both, it should receive a winter fallow, and either a complete *red* summer fallow or a turnip fallow, which is very properly styled a *green* fallow. The lime laid up in heaps, exposed to the air for as long a time as possible, should,

as in the former case, be spread upon the fallowed land, after it hath received the seed furrow.

Lime from different quarries, and even from different strata of the rock in the same quarry, is of very different strength, or, in other words, hath very different degrees of the quality of attracting oils, salts, and nitre, from the atmosphere, from vegetables, and from the earth. By a chemical process, the respective strengths of different limes may be ascertained with considerable precision. But without such a process the common farmer, who is not always a philosopher, may ascertain them with nearly the same accuracy, and with equal utility to the purposes of agriculture. Commonly, the whitest lime is the best: but colour is not an infallible criterion of strength. I have repeatedly met with a dark-coloured lime much stronger than a very white lime. But the following are certain marks of the strength of lime. Well burned lime-stone, which is commonly called *shell lime*, or lime reduced to a fine light dry powder by the application of water to shell lime, which is called *quick lime*, is strong in the *inverse* proportion of its weight; the lime in either of these states *specifically* the lightest is in the same proportion the strongest. The only exception to this is lime made from burned *chalk* stones, or from *lime-stone* which hath a very great proportion of *chalk* in it. This is a very white and light kind of lime, though weak. But *chalk*, and *lime-stone* approaching near to *chalk*, are easily known by ocular inspection. When quick lime, completely powdered, is sifted through a fine hair cloth, that is the strongest which leaves upon the cloth specifically the smallest quantity of earthy or sandy particles; that is the strongest, of which the smallest quantity, when spread on the same space of ground of soils of equal quality, will ferment the soil of that space to such a degree that it will not bear corn or grafts for some years. And also, that *quick lime* is the strongest which bears the greatest quantity

ity of the *same kind of sand* when made up into mortar for building, without being *too poor* to cement the stones, or, as masons term it, *to take band*.

The stronger the lime is, proportionally the smaller quantity should be laid upon the acre. The quantity ought to be proportioned also to the quality and state of the soil. The smallest quantity ought to be laid on the shallowest, lightest, loosest, and warmest soil ; and the quantity should be increased in proportion to the increase of the depth, heaviness, stiffness, and coldness of the soil. *Cæteris paribus*, the greatest quantity should be laid on *old lay land*, or entirely *unbroken land*, which had never been limed before. Land, once sufficiently limed, should not be limed again for nearly twenty years ; and the second course of liming ought to be about a third part lighter than the first. The proper quantity of *good lime* for a first liming, in proportion to the natures and state of the soil, as already noticed, is from thirty-six to eighty Dumfries measures of *shell lime* for a Scotch acre. The Scotch acre is to the English nearly as four to five, and the Dumfries measure of lime is nearly two Winchester bushels. A measure of *good shell lime* produces about two measures and a half of *quick lime*, or dry powder, when newly slacked. As the same ship or cart contains a much larger quantity of lime in the *shell* than in the powder, it is all carried in this county in the *shell*, both by land and water, and ought always and everywhere to be so, for the same reason. Ships employed in carrying lime in this state ought to be *very tight* ; for if a considerable quantity of water penetrates into the lime, it will soon heat and swell to such a degree, that it will burst and burn the strongest ship.

In the able survey of the county of Mid-Lothian, the writer mentions the well-known fact, that lime is seldom used as a manure in the low and rich arable part of that county, and gives

gives it as his opinion, that it would be of little benefit to that ground. It is true, that not only the coal-ashes, but more especially the great quantity of oyster and other fish shells, containing a fine kind of *lime*, and impregnated with *sea salts*, which have been carried from the streets of Edinburgh to these grounds for many years, in a small degree operate as lime on them. Yet I am clearly of opinion, that if these lands were put into a proper state for the application of lime to them, it would afford them the best and cheapest manure they have ever received, or perhaps ever shall receive. For lime always produces the best effect on a soil that is deep and full of oily substances, provided it is previously made *dry and clean*. Whatever the soil in that part of Mid-Lothian may have originally been, it is long ago rendered deep, and impregnated with oil, by the very frequent application of dung or oily substances for nearly a century back. But there is no land, where lime would be more completely thrown away, than in that part of Mid-Lothian, if unskillfully applied. In some parts the land is wet, and in many others very loose, by having been almost perpetually in tillage. If lime, when spread on such ground, were ploughed down, prevented from becoming *effete* by the wetness, and by its own specific gravity, rapidly sinking through the loose ground, beneath the corn soil, and the range of the roots of corn and grass, it would, for these reasons, afford no manure to the crops. That part of the county is also very full of the seeds of weeds, from having been very frequently dunged with such varieties of dung, and from its not having been allowed to lie a sufficient time in grass. If lime were properly applied to it, by being spread on the surface after the seed furrow, and harrowed in with the seed, from such exposure to the air it would soon become *effete*, greatly ferment the soil, and thus raise a great crop; but in its present state, full of the seeds of weeds, waiting a highly fermented and pulverised,

pulverised state of the soil for vegetating, it would be a crop *not of corn, but of weeds*, so numerous and luxuriant that they would choak the corn.

To put that part of the country into a proper state for lime, the wet land should be laid as dry as possible by means of open or covered drains, or by the direction, size, and form of the ridges and furrows, as the nature and situation of the land require; and the foul land should receive a complete winter and summer fallow. In many parts of the country, there is a frequent ploughing and harrowing without a crop for a year, which is called a fallowing. But this is conducted with so little judgment, that instead of killing, it greatly nourishes and increases the weeds. Though perswaded that many gentlemen and farmers, both in Mid-Lothian and in many other counties of the kingdom, know the proper mode of fallowing much better than I, yet not for the information of such persons who need it not, but for that of others who have paid less attention to this important branch of agriculture in a *cropping county*, than its importance to the interest of themselves and of their country demands, I shall give a short account of the proper mode of fallowing.

The objects of fallowing are three:—cleaning the soil of *root weeds*—of *seed weeds*—and *pulverizing* it so as to form a larger range in it for the operation of the air, of the internal effluvia of the earth, and of the roots of grain. *Root weeds* are all those kinds of noxious grass in particular, and of weeds in general, which, being perennial plants, are preserved and propagated by their roots. *Seed weeds* are all those weeds which, being annual plants, die to their very roots soon after they have shed their seed, and are propagated only by their seeds. It is a well-known and established fact, that the seeds of many of these weeds, often lie dormant in the earth for many years, without either vegetating or losing their vegetative quality;

quality ; and whenever the state of the soil, or of the season, becomes remarkably favourable for their vegetation, or they are brought, either by accident or art, nearer the surface of the soil and the influence of the air, they spring forth in great abundance, and choke the crop. The most effectual way of destroying *root weeds*, is to wither the roots completely ; thus to deprive them of their natural juice, and to contract those porous fibres, by which they attract vegetable food from the soil, and communicate it to the plant, to such a degree, as to unqualify them for performing those functions necessary to the preservation of the vegetable life. *Seed weeds* are most effectually destroyed, when their seeds are made to vegetate in the greatest abundance, and the weeds raised from them to rot, without bearing and shedding their seeds.

All soils that need to be fallowed, are infested with weeds of the one or other of these kinds, most of them with those of both, but often in very different proportions. The kinds and proportions of these will be easily seen by the eye, if attention is paid to the appearance of the fields, during the time of the previous crop or crops. Poor, overcropped, and exhausted lands, that had been seldom dunged, are most infested with *root weeds* ; and rich lands, too often in crop and frequently dunged, are most full of *seed weeds*. The last of these is the general state of the low lands in Mid-Lothian. All weeds injure the crop in two ways : first, by attracting to their own nourishment a great part of that vegetable food from the soil, the manures, and the air, which should have fed the crop of corn ; and, secondly, by obstructing the free circulation of the air around the stem or straw of the corn. By this obstruction, many of the weaker plants of corn are totally destroyed, and the straw of all the rest, near the ground and in the range of the weeds, is rendered too soft to convey a sufficient quantity of wholesome vegetable food up the stalk or stem to the ear, and too feeble to

support the corn until it is ripe. From this state of the stalk, the corn lodges before it is filled, lies flat on the ground, is either covered by the weeds, or by *edge-growing* (that is, young green corn, springing up from the ears of corn lying with one edge or side on the ground), a great part of it entirely rots on the ground, and all the rest is of an inferior quality, both of grain and straw.

Even from the reason of the thing, previous to all experiment, it will be evident to every intelligent person, that as *root weeds* are destroyed by being deprived of their vegetating quality, and *seed weeds* by being made to vegetate in abundance, the modes of fallowing for each of these ends, must be as opposite to each other, as these ends themselves are, and that they cannot both be carried on, in the same instant of time, on the same field. The same operation cannot, at the same moment, both encourage and check vegetation.

The first object in fallowing a field, infested with both kinds of weeds, is, to destroy the *root weeds*, because the operations necessary for destroying them, greatly prepare the soil for those by which the *seed weeds* shall be afterwards destroyed. But if the destruction of the *seed weeds* was first attempted, the operations necessary for that purpose, would greatly strengthen the roots of the other weeds: and also because the first part of the fallowing season is, from the *state of the air*, most favourable for destroying *root weeds*, and the last part of it for destroying *seed weeds*.

To accomplish these two important purposes, the field that is to be fallowed, should receive the first ploughing in the month of November, in as dry a state of the weather and of the ground as can be obtained. It should not be earlier, lest the mild weather in October should give too much encouragement to the growth of grass roots, nor later, if the weather shall permit, lest the frosts setting in should stop it too long.

This

This furrow should be ploughed so deep as to turn up the roots of the weeds. It should be cut as narrow as practicable, and not laid flat, but left standing as straight upon its edge as possible, that so far as practicable there may be a small rib or empty space between every two furrows, for the free circulation of the air. In this rough *unharrowed* state the field should lie until the first very dry weather in the beginning of March, or any time between that and the middle of April that such weather occurs. Then, *still without being harrowed*, it should be *cross-ploughed* with a furrow as narrow and deep as the former. After this operation, the soil will lie in small square rough pieces, with the air circulating round every one of them, and withering those grass roots in them which, from their situation through winter, had been nearly destroyed by the frost. In this state it should lie for ten or fifteen days in the *driest weather* that can be got, or considerably longer waiting for dry weather, and then in *the driest weather* it should be very completely harrowed, both along and across the ridges, by a drag harrow, and a few days after by a light harrow. By these harrowings the roots of the weeds, shaken loose from the soil, will lie as a light cover on the surface of the field like tedded hay. In this state they should lie for some days, to dry more completely, and, if the weather hath been dry, they should then be thrown into heaps all over the field by pitch-forks, and, while *lying loose*, burned into ashes and scattered over the field. But if by the moisture of the weather they will not burn, they should be carted off the field, laid in large heaps, afterwards made up into compost dunghills, and completely dissolved by a proper mixture of lime, marl, sea-shells, or horse-dung. By the operation of the frost in winter, and of the dry winds in the spring, upon the roots, so fully exposed to them by the divided and rough state in which the soil had been laid up by the two ploughings, these weeds, in ordinary years, completely withered.

shered, and having lost their hold of the soil, will be easily extracted from it by these two harrowings : and if any remain in the field after the burning or carting off the withered root weeds, their vegetating quality being thus destroyed, they will soon die away.

Now a different end is to be obtained, and different means correspondent to it must be used. *Seed weeds* are to be destroyed by being made to vegetate. The field, cleared of root weeds, must be ploughed with a very shallow furrow laid as flat as practicable. *Immediately* after the ploughing, it must be harrowed very fine and smooth, with a light harrow. In that state it must lie until it is completely covered over with a crop of weeds. When the forwardest of these are beginning to form their seeds, they must be ploughed down with a furrow a little deeper than the former, and laid as flat. Immediately harrowed as formerly, the field must lie until it is covered with another crop of weeds, which, when come to the former state, must be ploughed down with a furrow still a little deeper. In this way one quantity of the seeds of weeds after another must be brought by the plough, in regular succession, from different depths to the surface of the soil ; which, by a light and fine harrow with short teeth, must be pulverised to a fit state for encouraging their vegetation ; and one crop of weeds after another must thus be buried in the soil until few weeds or none grow upon the field. All this may be accomplished by the end of September. Of all seasons, the most favourable for a complete fallow is a frosty winter, a dry spring, and a showery warm summer and harvest. In the low part of Mid-Lothian, immediately after the fallow hath received the seed furrow, with which it should be ridged out in a proper manner in the end of September, a proper quantity of *effete lime* should be spread on the surface, and the wheat feed harrowed in with the lime. Not only will the lime, thus laid on the Mid-Lothian

Lothian ground, produce a very rich crop of wheat, but the following crops will be much better for the lime for many years, if the land is kept under right management. This theory is confirmed by many repeated experiments made by myself and others. In the old bad management of land in Dumfrieshire, a part of every farm was called *the croft*, which was kept always in crop, and on which all the dung of the farms, including the ashes, had been laid, time immemorial. These crofts, by constant tillage and frequent dungings, were brought to nearly the present state of the low lands of Mid-Lothian. For several years back, many of these crofts have been fallowed and limed in the way described above, and in every instance, the lime hath had a most powerful influence on them.

In some parts of Dumfrieshire, near the Frith, sleech and sea-shells are used as manures. Sea-shells are banks of dissolved sea-shells within tide-mark, impregnated with salt from the sea. Sleech is a rich sludgy mixture of fine earth and clay with some sand, impregnated with salt from the sea, lodged in lakes, creeks, or hollow and land-locked parts along the sea-shore, and near the foots of rivers, within tide-mark. From the salts which are in them, and from the quantity of shell lime in the former, both these operate nearly as lime does, and ought to be applied to the soil in the same manner, but in very large quantities, on account of the great proportion of sand, earth, and clay, which is in them. These manures will not bear the expence of a long land-carriage, on account of their great weight, and the great number of cart-loads necessary to dress an acre. There is very little marl in this county, but it is very plentiful in many parts of the adjoining stewartry of Kircudbright. There are three kinds of it:—the stone—the clay—and the shell marl. The stone marl, dug out of a brittle rock, broken small with hammers, and spread for a considerable

time

time on the surface of the ground, dissolves slowly by the operation of the air, and enriches the soil. When a large quantity is spread upon the soil, it is, at first, a slow but a permanent manure, and a great destroyer of weeds. Clay marl is a rich mellow clay dug from pits, which easily dissolves by the influence of the air. Shell marl is much the richest and best kind. It is a rich calcareous earth, full of small shells, supposed to be formed under ground by a small insect. Many of these shells are greatly dissolved, and some of them are quite entire. This marl is dug from pits, or dragged from the bottom of lochs or lakes by boats and instruments formed for the purpose. All marls ferment with acids ; and those are the strongest and best of their kinds which ferment most abundantly with the weakest acids. Marls partake of the nature of lime, with a mixture of a large quantity of earth, and therefore operate like lime upon the soil, must be applied to it like lime, but in much greater quantities. On account of the great quantity necessary to dress an acre, marls will not bear the third part of the distance of land-carriage that lime will bear.

The reason why there is much lime-stone and little marl in this county, and the very reverse in the next one, the stewartry of Kircudbright, is, that *this* is generally a *free stone* district, and *that* a *whinn* or hard blue *stone* district. A country which lies on a bed of *free stone* commonly abounds in *lime* and *coal* ; and one that lies on a bed of *whinn stone*, provided the natural soil is kindly, and the rising grounds are interspersed with land-locked morasses, mosses, and lakes, abounds in marls. The natural position too, or, as miners term it, the *dip* of *free stone* is favourable for working quarries of lime stone and pits of coal, while the *dip* of *whinn stone* renders it almost impracticable to work either under such a bed, even if they were under that stratum. Free stone in general lies nearly horizontal, or, as miners term it, with a *small dip*, but *whinn stone* as nearly

nearly perpendicular, or with a *great dip*. Let us here admire and adore that Divine wisdom and goodness which hath placed the *coal* near the *lime stone*, with but which the latter would be of little use to man, and both under that stratum which renders it practicable for man to extract them from the bowels of the earth, and hath placed *marl*, which does not need the application of fire to render it a manure, in those countries where coal cannot be found nor dug.

All these kinds of manures, by highly fermenting, greatly pulverising, and stimulating the soil, make it speedily and completely force out of itself, into the plants upon it, all the vegetable food it contains. Hence land injudiciously managed for some years, after it hath been sufficiently dressed with any of these *stimulating* manures, will be reduced to a much worse state than it ever was or could have been in before such manures had been applied to it. By over-cropping, without the application of *dung* or oily substances, it may be reduced to a *caput mortuum* that can bear neither corn nor grass. In this way the soil, totally deprived of all those oily substances which are necessary to feed vegetables, and to form a proper cohesion among the finer particles of earth, is rendered so excessively poor and loose, that it can neither feed, nor even support, the roots of corn or grass. To this completely barren state I have seen many fields reduced, by the injudicious management of the farmer. In many of these instances, his greediness to take a crop or two more from his lime or marl than he ought, first completely impoverishes his farm, and then himself, as the necessary consequence. In agriculture, as much as in any other thing, it is of bad consequence to be *penny-wise* and *pound-foolish*. In this case, it is not true, that a bird in the hand is worth two in the bush. After land is dressed with these manures, only two crops of grain, or at the most, in some particular soils and

states

states of them, three should be taken, until the land is laid out to grass for some years, or completely dunged, to supply the great waste of oils on the preceding crops by such strong fermentation. Soil reduced to a *caput mortuum*, by over-cropping, after liming, or by over-liming, can be restored only by a full dressing with oily dung, or by being laid out to grass for many years.

As dung of all kinds is of a very different nature from these stimulating manures, as the manure in itself does not attract it from the air, but, on the contrary, many of its finest qualities are exhaled by the air ; hence it must be applied to the soil in a different manner. Dung, when first collected into a dunghill, soon ferments, or, as it is called, *heats* greatly. When this fermentation is completely over, the dung is in the fittest state for being spread on the land. This fermentation is necessary for two purposes : first, by over-heating the seeds of weeds, which, from many causes, are mingled with the dung, to destroy their vegetating quality ; and, secondly, to dissolve, by putrefaction, the various substances of which the dunghill is composed, and thereby to reduce them to a manure. Every day after these purposes are accomplished, the dunghill diminishes, both in quantity and quality, by exhalation, and most in the warmest weather. But till these are accomplished, to spread it on the soil would be to sow a large crop of weeds, and to apply unripe dung to the land. To prevent exhalation, the dung should be ploughed in with the seed furrow, as soon as possible after it is equally spread on the surface.

FARMING UTENSILS, DRAUGHT CATTLE, AND USUAL SEED-TIME AND HARVEST.

THE ploughs in general use are, the English plough, the old Scottish plough, and the Scottish plough with the English mould-board. The first of these is used in soils free of stones ; the second in land full of stones ; and the third, composed of parts of both, in soils in the medium state between these two. Of these three kinds are the soils in different districts of this county, and each of these ploughs is the most fit one for the nature of the soil in which it is used. They are made handsome, light, and with as *little friction* on the *sole* and mould-board as is consistent with a *steady* motion, and with the *clearing* of the furrow. A plough is commonly drawn by two strong horses ; and one man commonly holds the plough, and drives the horses by a pair of long reins. In breaking-up stiff land from grass, three, or sometimes four, horses are yoked into a plough of the same construction, but of a stronger and larger make.

Light handsome carts, of a good size, drawn each by one horse, are most commonly used, as being the most profitable. In long carriages out of the farm one man drives two of these carts. The bodies or boxes of these carts, made so close as to hold dung, lime, or the finest sand, are formed to *crop* or turn up, in order to empty them of the loading at once, without unyoking the horse from the *shafts* ; and when brought down again, they are secured by a very simple iron locker on the fore-part. When employed in carting corn, hay, straw, or any other light top-loading, a handsome, light, and large frame, called a *shelving*, much longer and wider than the box, is placed over, and in a very simple and effectual manner fastened to it, upon which the top-loading is built, of sufficient length and breadth. Some carts drawn by two horses, and a

very few waggons drawn by four or more horses, are used. The harrows and rollers are of a very good and simple construction. *Fanners*, or machines for dressing corn, by supplying the want of natural wind, of a very good construction, are common ; and there are some, but only a few, *treshing machines*, driven by horses. Where water can be got, it is much preferable, on many accounts, to horses, for that purpose.

Only few oxen are used in the draught. Their motion in the cart and in the plough is so slow, compared with that of horses, that the greater quantity of work performed by horses is more than a compensation for the difference of the expence of feeding, and for the beef of the superannuated steer. Besides, the only soil in which a team of oxen is preferable to one of horses is that which is very *deep, stiff*, and free of earth-fast stones. But there is little of that kind of soil in this county.

In a county so extensive, and so various in elevation, exposure, climate, soil, and cultivation, the seed-time and harvest are equally various. In some parts of the county they are as early, and in others nearly as late, as they are in any part between Solway Frith and the Frith of Forth, and between the eastern and western boundaries of Scotland. These seasons are earliest in the south side of Nithsdale. There the times of sowing are, for wheat, from the middle of September to the end of October ; for oats, pease, beans, and flax, from the tenth of March to the twentieth of April ; for potatoes, bear, and barley, from the twentieth of April to the twentieth of May ; and for turneps, from the tenth to the twenty-fourth of June. The harvest ordinarily begins before the middle of August, and the crop is got totally into the barns and barn-yards by the tenth of October. In cold and wet seasons it is somewhat later.

The

The seed-time and harvest are a little later on the south sides of Annandale and Eskdale. In all these three districts they become gradually later towards the northern parts of them, which are more elevated above the level of the sea, more removed from the temperature of the sea air, and of a soil and subsoil naturally more cold and wet. And from the natural dryness and fertility of the soil in Nithsdale, even to its northern extremity, that district preserves to its north side, the same comparative earliness of seed-time and harvest with the other two districts, with which it began at its south side. In the latest parts of all the districts there is not much crop.

INCLOSURES.

MUCH land is inclosed, but much more still lies open, greatly to the hurt both of the beauty and of the utility of the county. Some lands derive more benefit from inclosing than others; but, in general, *sufficient* inclosing increases land about one third in its value. I have said *sufficient* inclosing, because fences which do not keep in cattle night and day are worth nothing. They are just so much land wasted as they stand upon, and so much money thrown away as was paid for building them. Open land, worth twelve shillings *per acre* of yearly rent, will be worth eighteen shillings *per acre*, when it is sufficiently inclosed, and divided into parks of a proper size for the extent of the farm.

The size and number of the inclosures should be proportioned to the extent of the farm, and to the nature of the rotation of crops to be carried on in it. In the example given of a ten year's rotation on an arable farm of one hundred and fifty, acres there should be ten divisions of fifteen acres each.

In other farms their number and size should vary, on the same principles, with their extents and rotations.

Fences vary in their materials, construction, and nature, and in the expence of making them, with the nature and situation of the land to be inclosed, and with the nature, quality, and distance, of the materials for constructing them. The best, cheapest, and most permanent fences for wet lands, are, ditches with a bank on one side, in the form of a fail dyke, made of the earth which is thrown from the ditch. The ditch should be six feet wide at top, eighteen inches wide at bottom, and four feet deep ; and the bank or dyke should be four feet wide at bottom, fourteen inches wide at top, and three feet and an half high. A smaller ditch than this will not be a *sufficient fence* ; but if there is a large run of water to be drained off, the ditch must be made as much larger as is necessary to carry off the water. Between the side of the ditch and the bottom of the dyke there should be a scarcement of about a foot, and, in order to save the expence of fencing the thorns, a thorn hedge should be planted near the bottom of the dyke, on the side *next the ditch*, if the ground is not *very wet* ; but if it is excessively wet, fallows, willows, elders, birch, or other aquatic bushes or trees, should be planted, in order to strengthen the fence, shelter the ground, and pay for the soil on which the dyke stands. Cold deep lands, where there are no stones for fences, are inclosed by what is called a *clapèd dyke*. This is a fence very like the former ; with this difference, that the side of the bank nearest the ditch is formed of the loose mould, with a great slope from the bottom to the top, and, to hinder it from rushing into the ditch, it is closely clapèd together with shovels. The former fence is preferable to this.

In light dry land, full of small tumbling stones turned up by the plough and harrow, the best and cheapest fences are dykes

dykes (walls) four feet four inches high, four feet wide at bottom, and fourteen inches at top, faced on both sides with these stones, *only one stone thick*, each row of stones being beaded *very thin* with earth full of *grass roots*. On the one side, on the top of the second row of stones from the ground, a row of thorns should be laid in or planted when the dyke is building. The whole heart of the dyke should be filled with earth beaten very solid. The top should be finished, not with a cope of turf, but with fine mould, as these dykes on dry soil need all the rain they can receive at top to make the beds of grass roots grow among and bind the stones, and to afford sufficient moisture to the thorns. In most cases, these are the only dykes that should be built on light dry land, where stones of sufficient size and quantity for double dykes cannot be got, unless at an enormous expence. Fail dykes upon such land are no fences. Though cattle cannot leap, they climb over them, and in a very few years they moulder down. On light dry land, thorn hedges grow so slowly that a fail dyke will not defend them from the injury of cattle, nor stand till they become a fence. These are very complete and durable dykes when rightly built; but of all others the least permanent when improperly constructed. Three-fourths, at least, of this kind of dykes in the country are constructed with so little skill, that they cannot, and, in fact, do not, stand two years.

When improperly constructed, these dykes always fall, by bulging or bursting out in the *middle* of their height. This is owing to the *heterogeneous* materials of which they are constructed. The outsides built of stones, from their solidity, do not settle much; but the inside or heart, composed of earth, from its looseness settles much. When the heart settles downward from the top, and the backing falls away from the rows of stones near the top of the dyke, these rows of stones

lean

lean inward ; and, in proportion as the earth settles down from the top, it swells about the *middle* of the dyke, and forces the stones out, and the dyke down, at that part.

To prevent these causes from operating to the destruction of these dykes, they should be constructed in the following manner. About nine rows of good stones will bring them to the proper height. The first three rows at the bottom should be built with a very small *bevel*, or leaning backwards ; the second three rows with a great bevel ; and the last three rows with as little bevel as the first three had. The heart must be beaten very hard down to each row of stones, and must be so much raised above the level of the preceding row of stones, that every row when placed on its bed must lie, not horizontally, but considerably lower in the outward than in the inward end of the stone. The largest stones should be laid at the bottom of the dyke, and they should gradually diminish in size to the top. They should all be laid with one *end* in and the other out in the dyke. After the whole dyke is raised to half of its height, it should settle for some months in that state before it is finished off. Constructed in this way, the heart of the dyke will not settle much, and the little that it does will bring all the stones to lie nearly horizontal, and will bulge out the three middle rows to the same bevel with the rest of the dyke. If thorn hedges are not to be planted in them, the most permanent of these are old *fail* dykes, that have stood for some years, faced with stone. I got some done this way twenty years ago, which have been complete fences ever since, are so still, and have never needed any rebuilding.

Each of these kinds of fences are the best for their respective lands, being the most complete, permanent, and cheap, in their particular situations, and communicating to their respective soils those advantages which they most need. The first of these

these drains off the superfluous and injurious water, and shelters the cold soils. In such soils thorns and all aquatic bushes and trees grow quickly, and rise to the greatest height : and the second of these, which is almost the only one practicable on such lands, clears the fields of the small tumbling stones. The prices of these fences vary with the hardness of the grounds. They may be made from one shilling and three-pence to two shillings *per* rood, besides the price of the thorns, and the expence of gathering and carting the stones. The rood for all fences in this county is six Scottish ells, or nineteen feet of length, running measure along the dyke or ditch, without measuring height, depth, or breadth. These last dimensions are all fixed at making of the bargain, and particular respect is had to them in fixing the price of the rood of fence.

In lands where there are either whinstone quarries, or large detached stones of sufficient size and quantity for double stone dykes, which is the case with many parts of this county, especially in the Nithsdale district, such stone dykes (or walls) are the fences. These dykes are built of stone, without any lime or mortar, and are the best of all fences for *farms*. Walls built with lime would be much better ; but the additional expence of *building*, as well as of lime, renders them improper for *extensive farms*. Those for lands kept under the plough, and for the pasturage of horses and black cattle, are built of the following dimensions : Thirty inches wide at the bottom, fourteen at the top, coped with a row of long flat stones placed very closely together, and four feet four inches high to the top of the cope-stone. In lands pastured with sheep, the dykes are five feet six inches high, of which three feet is double, then a band-stone of six inches thick, and two feet of single dyke in the top. These last are commonly called.

called Galloway dykes, because they abound in that part of the kingdom.

The expence of building these dykes varies with the quality of the stones, the difficulty of raising them, the distance from which, and the nature of the ground over which, they are carted. According to the variations of these particulars, the raising, gathering, and carting of the stones, are from one shilling to three shillings *per* rood, and the building of the dyke is from ninepence to one shilling and twopence *per* rood.

These dykes, well built with a sufficient quantity of through-bands, stand for many years, if they are founded on a soil that lies on a sandy or sandy-gravel bed. But those that are built on a soil which hath a bottom of clay or till, tumble down, in many parts, in the time of a very intense frost, or of a sudden thaw after such a frost. The same materials being sufficient for repairing them, the expence of rebuilding is not great.

The reason why they frequently fall, on the last of these foundations, in an intense frost or a sudden thaw, is, that the foundation is turned, by these states of the air, from a horizontal to a sloping state, and then the dyke falls to the low side. Unobserving or unphilosophic men may, at first, doubt this fact, or regard it as unaccountable. But it is absolutely certain, and easily accounted for. Certain warm effluvia, as a kind of natural perspiration, perpetually rise from the interior parts of the earth, and force themselves through the surface of the ground into the surrounding atmosphere. Though the intense frost does not bind the dry and loose sand and gravel to such a degree as to close up all the interstices of these porous bodies, yet it renders the till and clay too close and hard for these internal effluvia to force their way through them.

them. Still moving towards the surface, and unable to penetrate the crusted clay, these effluvia make such ground to swell up to a great height.

Here it may not be improper to observe, in passing, that this kind of ground swells so much, that the large stones, which happen to be in it, keeping their place, appear to be greatly sunk ; and the ground, at last, forced open, in many parts, by the pressure of the warm effluvia, cracks and opens passages for them into the atmosphere. By the sudden and great addition of these long-imprisoned warm effluvia, the atmosphere is rendered mild, and a thaw comes on. These effects the common people frequently observe ; and they have long regarded the sinking of the stones, and the cracking or opening of the surface of the ground in such soils to a great degree, as the surest symptoms of an approaching thaw ; which thaw, to distinguish it from the slight, short, and occasional ones, that arise from a slight change in the state of the air, they call a *ground thaw*. I have frequently observed not only stone dykes to fall from this cause, but also walls of houses, founded on such ground, and not below the reach of the frost, to rend and crack in a frosty winter, though they had stood perfectly entire for many preceding mild years.

In this, as in all other things, the first step to the discovery of an effectual cure, is a clear knowledge of the nature and causes of the disease. The falling of these dykes will be prevented, if the foundation, on which they are built, can be kept in its horizontal state, notwithstanding the influence of the frosts and thaws. The following directions, if observed in the original construction of the dykes, will prove effectual, in most cases, to this end.

1st, The line of the longest dykes of the inclosure must run from south to north, as nearly as the situation of the ground, and the figure of the inclosures, will permit, so that

one side of the dyke may be due east, and the other due west; or as near these points as can be.

2dly, The earth must be dug out of the ground on which the shorter cross dykes are to be built, in the same way in which it is dug out for the foundation of houses. But to keep the expence of digging moderate, and not to bury many stones under the natural surface of the ground; the foundation should be dug only about nine inches deep, and the earth should be laid up for about nine inches high on each side of the dyke, so that the frost must penetrate eighteen inches into the ground before it can affect or change the position of the clay, or till, on which the dyke is founded. In Dumfries-shire frost very seldom penetrates to that depth.

And, 3dly, All the stones must be laid the *long* way of the stone *through the dyke*, even though, thereby, the outside of the dyke, should not have so close and fine a face as otherwise it might have had. This position of the stones must be attended to, as well in the heart as in the outsides of the dyke. I do not, here, speak of laying the largest and broadest stones in the foundation, of making a sufficient scarcement above the foundation-stone, of laying as many through-bands as can be got, of locking the cope-stones very close, and of building the whole dyke well, as all these particulars must be attended to in the construction of dykes on every foundation. But the three preceding directions, respect the peculiarities in the proper construction of dykes, on foundations affectable by frosts and thaws.

The reason of the first of these directions is, that, for all that part of the year when the frosts and thaws are intense in Britain, the range of the sun in the whole latitude of this island, is from south-east to south-west; and on each day the sun sets as many points of the compass to the west of south, as it rose on the same day to the east of south, or of its

meridian.

meridian altitude for that day. Hence, if the line of a dyke runs east and west, in a continued frost, the ground freezes night and day, without intermission, on the north side of the dyke, because the dyke interrupts the rays of the sun from the time of its rising to that of its setting ; whereas the ground thaws much on its south side, for several hours every day, by the rays of the sun shining upon it, with nearly double the heat with which they strike even upon an open field. With their natural warmth, the direct rays of the sun shine on the ground on this side of the dyke, and with an artificial heat they are also reflected upon it from the close and hard surface of that side of the dyke. In winter too, the sun being very low, its rays strike the dyke in such an angle, as gives great additional force to the reflection. From these causes, during the time of frost, the foundation of the dyke, rises much faster and higher, on the north than on the south side of it ; and from the same causes, on the return of the thaw, it settles down to its natural state, much sooner on its south than on its north side. Hence, when built on such foundations, and in such directions, stone dykes, in an intense frost or sudden thaw, in many parts fall to the south side. But if they are built from south to north, the sun shines just as many hours, in the afternoon of every day, on the west side, as it had shone, in the forenoon, on the east side of the dyke, and the degree of its heat is uniform, being reflected from the same angles on each side of the dyke. Hence the frost is never so intense, nor the thaw so sudden, as the former is on the northern, and the latter on the southern, side of a dyke running east and west ; and, which is still more in favour of the stability of the dyke, the frost is always equal on each side of it, as also the succeeding thaw is. Hence, though with the increase of the frost, the foundation gradually rises, and with that of the thaw it gradually subsides, the rise and the fall being equal on each side of the foundation, its

level situation is still preferred, and the dyke is in less danger of falling.

The reason of the second is, that it prevents the frost from penetrating to and swelling the foundation, upon which the dyke is built. And that of the third is, that the center of gravity of each stone, is at as great a distance as possible, from the outside of the dyke. Hence, though the dyke should be put considerably from its horizontal to a sloping state, the stones would not lose their balance and tumble down. Placed in this way, every stone has a larger bed upon the one beneath it ; and therefore, in case of a declivity, has proportionally more friction to overcome, before it can slide entirely from its bed. In stones of a rough pile, this friction is very great, and is a considerable security for the stability of the dyke or wall.

Wherever inclosures are properly conducted, they greatly increase population. The great increase of labour necessary for making these inclosures, gives employment and bread to an increased number of persons. The inclosing of any extensive district, is the work of many years. And after the inclosures are finished, the necessary operations of higher culture, the greater quantity of produce and of food raised from the same quantity of land, secure a permanent increase of population. Where there is most employment and food for man, there, *ceteris paribus*, population will be greatest. In this respect, as strongly as in any other, the proverb holds true : "Where-
"soever the carcase is, there the eagles will be gathered toge-
" ther."

Until land is *properly* and *sufficiently* inclosed and sub-
divided, cultivation cannot be carried on to full advantage.
The more cultivation is carried on, the more hands are neces-
sary to dress and manure the ground, and to manufacture the
increased produce.

The

The more attention that is paid to the choice and management of the breed and fleece of sheep, the finer wool is produced, and in larger quantities, and more hands are necessary both to give that attention, and to manufacture the finer wool.

But the greatest and most permanent cause of population from cultivation of land is, that such culture, by producing, every year, more corn, butter, cheese, butcher's meat, flax, and wool, than are necessary to feed and clothe even the increased population employed in producing them, forms an increasing and perpetual source of riches, which, in the channels of exported food and raiment, flows into and settles and swells up in that district. Wherever there is most opulence, food, and clothing, there will be the greatest population, *ceteris paribus*. The abundance of these three articles form the best means for employing, in various useful manufactures, the supernumerary hands, which can be fed and clothed, but not employed in agriculture, the best of all manufactures.

Of all mines, those thus opened, not in the bowels, but on the surface of the earth, most completely enrich the country in which they abound. Man can neither eat, drink, nor be comfortably clothed with gold, silver, or precious stones. These, wherever they are dug or gathered, will, at last, find their way to, and, in the greatest abundance, settle in that country, which can give for them the greatest quantity of food and raiment, of the best quality, and at the most equitable prices. The discovery of South America hath beggared Spain. The great quantity of gold and silver, which she, annually, draws from her American mines, is handed by her to the countries in which agriculture and manufactures flourish, while she continues equally poor both in these, and also in that gold and silver, which she imports in her registered ships only, to reward the skill and industry of other kingdoms.

These

These *superterraneous mines*, are at once the most productive of real and permanent riches, and the most friendly to population, and to the peace and good order of civil society. Of all employments, those of agriculture are the most friendly to health, vigour, population, and longevity. They consist in manly and uniform exercise in the open air ; but not in that which is violent, intermitting, or dangerous. Not having such frequent opportunities of associating in large clubs, as men in many other departments of life, farmers are, and always have been, the most peaceable subjects and members of civil society.

When, from various causes, bankruptcies prevail to a great degree in any country, as they did in this in the æras of 1772 and 1793, farming districts are much less affected and hurt by them than those in which manufactures and banking abound. The reasons are obvious : 1st, Luxury does not proceed with such rapid strides among country farmers, as among those who live in large towns : 2dly, Farmers seldom speculate so far beyond their real capital, or run such great risks : and, 3dly, which is the principal one, the manufactures of the farmer are necessaries, but those of many other manufacturers are comforts, ornaments, or luxuries of life. In the time of distress, men retrench in the use of these last articles, but necessaries they must have, as long as they exist at all in this state. Hence the demand for the produce of the farm continues, when thousands of manufacturers are reduced to idleness and want, because there is no demand for their manufactures.

COMMONS,

COMMONS, WASTE LANDS, AND THE IMPROVEMENT OF THEM.

FORMERLY there were several commons (or *commonties* as they are called) in this county. But, some years ago, the greater part of them were divided among the surrounding *heritors* (proprietors of land), in proportion to the servitudes, which the dominant tenements had upon the common, for the years of the long prescription, according to the law of Scotland. Though this law, is much more favourable for the division of commons, than that of England, yet the length of time and expence of a process for division of commons are so great, especially when the parties in the process are numerous, that in some instances heritors might purchase as much land of equal quality, for little more money than the expence of the division. There are still a few commons ; but the most of these belong to some of the royal boroughs ; and the division of them is prevented chiefly by the nature of their charters, or the jarring views and dispositions of the burgesses.

In some parts of North Britain, and in very many of South Britain, commons still continue. So strong are the old habits which men have formed from generation to generation, and so very difficult is it to make illiterate or unthinking men change these, even when, like all bad habits, they are equally disgraceful and hurtful to themselves, that it is much easier to point out a method of improving commons, highly advantageous to the public and to the private proprietor, than it is to persuade these men, either to embrace or acquiesce in that method of improvement. Commonage is so inimical to all improvement of land, and a source of such perpetual contention, even to those persons who are so unreasonably attached to it, that though many methods of correcting the present mode

of commonage might be suggested, no one of them would be beneficial, permanent, or generally acceptable, to the persons who oppose the division of commons. —

In my humble opinion, a general act of parliament for the division of all commons, both in South and North Britain, should be passed. It should fix a method of division expeditious, cheap, and perfectly equitable and fair to every person who hath a right in the common. When a common is divided, every person should be allowed to improve his own part of it in the best way he can or will. His own interest, in forty-nine instances out of fifty, would soon lead him to promote the public good, by making his own lands produce to himself the greatest crops, at the most moderate expence. It might be for the advantage of the individuals, and of the public at large, to give directions, and some pecuniary or honorary assistance, in different parts of the kingdom, to a few public-spirited and liberal-minded proprietors, or tenants, of some of these divided commons, that, by their example and the richness of their crops, they may lead on to improvements the other proprietors and tenants of the divided wastes.

The first of all improvement of such land is, inclosing and subdividing with stone dykes, where they can be erected at a moderate expence; and where stones cannot be got, with feal (turf) dyke, ditch, and thorn-hedge, and draining the land, where it is wet, by open or covered drains, as the nature and situation of the land point out. All the bad land should be planted with trees, whether it is level or hilly. The plants should all be put in young, both for cheapness, easiness of carriage, and hardiness. Young plants run much less risk of dying by the transplantation than old ones do. The kinds of trees should be suited to the natures of the soils, should be planted thickest where most exposed to the stormy winds, and the lines of trees and of the fences should be placed in such directions as to afford the greatest

greatest shelter to the plantation. A large quantity of *oak* and of *larix* should be planted, to secure an *internal* and *permanent* supply for the *British navy*; and a considerable quantity of *ash*, for the increased quantity of ploughs and carts which will be the consequence of the increase of agriculture. They should be sufficiently fenced from cattle of all kinds; and, wherever it is practicable, the belts and clumps of planting, should be placed in such directions as to inclose, shelter, and ornament, the adjoining fields. Many of the mountainous parts of these wastes, too high or too steep for cultivation, must always lie in pasture, even where the soil is naturally good. Inclosing and draining these parts, and regulating properly the stock of sheep or black cattle upon them, are the best improvements for such lands. In situations where lime or marl of any kind can be got at a moderate expence, a light dressing with these on the surface will greatly improve the quality and quantity of the grass on these mountains, and pay well for the expences. Where the soil is naturally good, and the land sufficiently level for the purposes of agriculture, these wastes should be cultivated with the plough. Where the surface is green, smooth, and brittle, a sufficient quantity of lime or marl should be spread upon it, a year, at least, before it receives the first ploughing, which should be the seed-sfurrow; and where it is black, rough, or stiff, it should be fallowed a full year before the lime or marl is spread upon it.

THE PRICE AND TIME OF LABOUR.

FROM the first day of March to the first day of November, labour, in general, begins at six o'clock in the morning, and ends at six o'clock at night; and the labourers are off work

one hour for breakfast, and another for dinner. From the first of November to the first of March it begins and ends with the light of day, and the labourer is off only once, for one hour. The wages of labouring men are, for the long day one shilling and twopence, for the short day elevenpence; for casting peats one shilling and threepence, and for mowing one shilling and sixpence: and those of women are, for working at peats ninepence; at turnip-weeding, bay-making, and other farming-work in summer, sevenpence; and for shearing (reaping), those of both men and women are one shilling and twopence. The day-wages of a joiner, mason, bricklayer, and slater, are two shillings. All these labourers and tradesmen provide their own bed and board at these wages. A taylor receives one shilling and twopence without, and eightpence with, his meat, *per day*. Smith-work is almost universally done by the piece, and work in general is performed in this way. The prices of joiner-work of all kinds vary with the quality of the materials, and of the work. Bricklayers, slaters, and masons, commonly work by the rood of thirty-six square yards, and the prices vary with the quality of the materials, the height of the building, and the mode of executing the work. Plasterers commonly work by the yard. Grain is frequently threshed by measure, at one penny the Winchester bushel. As yet there are few threshing-machines in the county. The prices *per rood* for dyking and ditching, were stated under the article of Inclosing.

When those who have work of any kind to be performed, are proper judges of the time necessary for performing it, and of its sufficiency when done, it is much better for themselves, for the workmen and tradesmen, and for society at large, to set it by the piece. In this way, the workmen being always *overseers* to themselves, work much earlier, faster, and later, and become much more dexterous in their respective occupations. Hence,

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the less money is paid; in this way, for the same quantity of work by the employer; the workmen earn much more in the same time; and much more useful labour is performed to Society at large, each year, by the same number of persons.

The average wages for farming, and also for domestic, servants, when they eat in the house, are, for men seven guineas, and for women three guineas, *per year*. But farming servant-men, especially in the Niclisdale district, are generally married, and paid by what is there called *a benefit*, that is, a house, yard, peats, fifty-two stone of meal, about thirty hundred weight of potatoes, and as much money as, *communibus annis*, with these articles, will amount to fourteen guineas *per year*.

DRAINING OF WET LAND.

MUCH wet land hath been drained with judgment and advantage, and much still remains to be laid dry. In places where this part of improvement hath been conducted with most propriety, the drains are of the best kinds for the situations in which they are placed.

These are two: *open drains*; and those called by writers on agriculture *hollow drains*, or, as more properly called here, *covered drains*.

The former are always used to carry off large quantities of water from morasses, lakes, runs of water from higher grounds, and surface-water. If practicable, they are made of such dimensions, and placed in such situations, as, at once, completely to carry off the noxious water, and to inclose the field. But if the situation of the ground is such, that they cannot be placed so as to serve both these purposes, they are then carried in that direction in which a sufficient level for conveying the

water can be got, at the least work, expence, and interruption to the cultivation of the field. And as inclosing is no part of the object, in this case the drains should be made no larger than sufficiently to contain and carry off the water. They should be made with such a declivity, as to make the water run off with a pretty swift, but not with a rapid, motion. The first degree of motion is necessary to carry off the sludge, and keep the drains from growing up with earth and grass; but the second would run them into pools in the softest parts, or where there are angles, and form banks in other parts.

The latter, or *covered drains*, are always used to carry off ~~under water~~, or springs from spouty grounds. Soil infested with this kind of superfluous and noxious water always lies in a declivity, near the bottom of higher grounds, and upon a subsoil or bed of clay, or till, or of some other body which resists water. Where the subsoil is sand, light gravel, or any very porous substance, whatever the situation of the field is, the water filtrates through the subsoil, the springs lie low, and the soil is not infested by them. And where there is no adjoining higher land, the springs have no fountain-head, higher than the field itself, to make them rise above the surface and drown the soil.

These drains should be placed in the following direction, and made of the following construction and dimensions: At the lowest part of the field, an open drain should be made across the bottom of it, of such depth and wideness, as to receive the water from the covered drains, and to convey it off the field. If this could be made the fence for that end of the field, it would save the waste of ground, and the expence of another fence.

In ascending the field, a person comes to a part, on the declivity of the ground, where the soil is very spouty and wet; above which all the higher part of the field is sufficiently dry. This highest spouty part runs across the whole declivity of the field,

field, and the water bursting out from it runs down the declivity, and spreads over the surface of all the lower part of the field. In this highest spouty part, the disease is seated, and here the cure must be applied. Instead of drawing a number of drains, from this part, down the declivity to the open drain at the bottom of the field, thousands of which would serve no purpose but the waste of time, materials, labour, and money, one sufficiently large drain should be made *across* the declivity, in the direction pointed out by the highest side of that spouty part. The highest side of the drain should be within two feet of the uppermost side of the spouty part, or lowest side of the adjoining dry ground. This drain should run, as the practical farmer styles it, *between the wet and the dry*. This is called the *land-drain*. If this can be made so as that the water, which is collected into it, will all run to any one point, from that point a drain must be carried down the declivity, in the shortest practical direction, to the open drain at the bottom of the field. It is of little consequence, either in respect of expence or utility, whether that point is at either end, at the middle, or at any other part of the drain. But if the water cannot be made to run to one point in the land-drain, there must be as many small drains, called *conductors*, from it, down the declivity to the open drain, as there are points in the land-drain to which the water falls, and at which it stops.

In general, the land-drain should be about three feet and a half deep, two feet and a half wide at top, and sixteen inches wide at bottom. A row of large field stones should be laid on each side of the drain, along the bottom of it, close to the solid earth, so as to leave an open space or conduit between them, of about four inches square. This conduit should be covered with a row of long field stones; and if these do not reach completely to the solid ground, on each side of the drain, a small stone must be closely packed at each end of the cover-stone,

prevent it from moving out of its place, and falling into the conduit. If any of the seams between the cover-stones are wide, a flat stone must be placed on these seams; then the drain must be filled up with small stones loofely thrown in, to about four inches above the level of the top of the till or subsoil. The whole top of these should be covered with a thin green turf, with the green side down, or, if such turf cannot be got, with a thin cover of small broom, heath, rushes, fern, straw, or anything which will hinder the mould from mingling among the stones: and then the whole earth that was dug out of the drain, should be placed upon the top of that cover, so as to render the ground arable, even on the top of the drain.

The conductors should be made of a sufficient depth to convey the water from the land-drain, of the same widenes at bottom, and only as wide at top as is necessary for digging them to their proper depth. The conduit in them must be made in the same manner, and of the same dimensions, with that in the land-drain; but they need very few of the small stones. They must be covered in the same manner with the thin turf, and filled up with the earth that was dug out of them. In all covered drains, there should be fourteen inches of earth on the top of the turf, to prevent the plough or harrow from tearing it up, and deranging the stones in the drain.

If the wet ground, between the land-drain and the open drain, does not fall more than three feet and a half of perpendicular height, one land-drain will be sufficient to dry the field. But if it falls more, a second, a third, or perhaps a fourth land-drain will be necessary. These must be formed in every respect in the same way with the first, must run in similar directions, lower down in the declivity of the field, and each at that distance from another that corresponds to the degree of the

the declivity of the field; for no drain can prevent the springs from rising, on any part of the surface of the field, which lies lower than the level of the bottom of that drain. The same conductors will serve for all the cross or land drains, however many they are. All covered drains should be formed with such a declivity as to make the water run swiftly, but not rapidly in them. A slow motion allows the sludge to settle in them and fill up the conduit, and a rapid motion raises much sludge from the bottom in some parts, and by lodging it in other parts blocks up the drain. They should lie open for some days, to carry off the first and greatest run of the water, and to wash the sludge away from the newly-dug drains. In laying the conduit, the workmen must begin at the *highest* part of the drain, regularly descending to the lowest part of it, and always clearing the sludge away before them. If the conduit should be begun at the lowest end, and carried on upwards to the highest, the sludge, collected in laying it, would render the drain nearly useless by the time the work of making it was finished. Particular care should be taken, to raise the top of the small stones in the land-drain, about three inches above the level of the top of the till or subsoil, because, in spouty land, the greatest part of the springs run between the soil and subsoil, and if not conducted, through the interstices of the small stones, into the conduit of the land-drain, a great part of them, keeping above the ~~till~~ substance on the top of the drain, run over it, and drown the lower parts of the field. The mouth of the conductors must be frequently inspected, and cleared of sludge.

These drains, on an average, are dug and filled-up for about nine-pence per rod of nineteen feet in length, besides the expence of gathering and carting the stones. The expence of this last article, is greater or less in proportion to the distance of the stones. This mode is much more sufficient than

than that practised in Mid-Lothian, and is fully as cheap, requiring much less digging of ground, and much less cartage of stones, which are the two most expensive articles. When the stones are thrown loosely into the drains, without any regular conduit, the quantity must be much larger, and the drain also to contain them, otherwise they will not catch and carry off the noxious water. Several years ago I have made many thousand rods of these covered drains in my own ground, and have always found them the best kind.

Some persons attempt to drain mossy ground by covered drains ; but they always fail of success. The reason is obvious to every person who attends to the nature of things. The cause of wetness in mossy ground is not the impenetrability of the stratum or bed on which the moss lies, nor springs running between these, but the spungy nature of the moss itself. Like a sponge, moss receives a large fill of water, and holds it long. Therefore covered drains are of little use in such ground, because the spungy moss will not empty itself into them with sufficient quickness. Small open drains, to catch as much as possible of the rain as it falls upon such ground, and to encourage the surface-water to run off without filling the spungy substance, are much more proper for preventing mossy ground from being soaked with water.

PARING AND BURNING.

THIS mode of improvement is not much esteemed or practised here. This operation is only of permanent advantage, where a small quantity of moor, or moss, lies on the top of a clay, that will dissolve when exposed to the air ; and when so much of the moor or moss is burned off, that the plough can reach

reach the marly clay, mix it with the ashes and the remainder of the moss, and thereby form a better soil. All land being brought so much lower by paring and burning, the soil is so much nearer the cold and wet bottom, that it is, always afterwards, much hurt by wetness, unless it is very sufficiently drained. But the most of such land lies in situations which render the draining of it very difficult. Hence, land that has been cultivated in this way soon over-runs with rushes when it is laid out to grass.

WOODLANDS.

THERE are many extensive, beautiful, and valuable natural woods in this county, especially in the Nithsdale district, and also many large and delightful plantations around the seats of the noblemen and gentlemen. Much attention is paid to the preservation and the rearing of the woods by the proprietors in general; though, in this as in other counties, there are a few exceptions. The low and sheltered situation of this county, especially the Nithsdale district, which is completely screened from the sea blast by the Galloway hills, is remarkably favourable to the growth of trees.

In the large tract of the neighbouring stewardry of Kirkcudbright, which runs along the Solway Frith, very few trees are to be seen. The blast from the sea renders it very difficult to rear them. To raise plantations in that district, the trees should be planted very young and very thick, to shelter one another; the rows of trees should all run from south-west to north-east; a close and high fence should be built on the south-west side, which is the side exposed to the sea blast; and especially, wherever it is practicable, the trees should be

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planted on the north-east side of the little hills with which the Stewartry abounds.

Many of the natural woods in Dumfries-shire have been cut within the last thirty years. In general, whenever they were cut, the stoles were completely fenced; the blank spaces filled up with young plants, and the woods weeded at the proper seasons. In the last twenty-four years, many extensive and beautiful plantations have been made, which have made great progress.

THE PRICE OF PROVISIONS.

THE prices of wheat, barley, oats, and potatoes, are generally regulated by the markets at Liverpool and Greenock, being just as much below the prices at these ports as will pay freight, risk, and a moderate profit to the corn-merchant who exports these articles. The London market for grain is generally a little lower than that of Liverpool, and only a very little higher than the prices here. Grain is generally cheapest here about Candlemas, owing to the farmers crowding their grain too much to market at that time, to raise money to pay their half-year's rent due at the preceding Martinmas, but usually paid at that term.

Communibus annis wheat is five shillings and fourpence, barley two shillings and fourpence, oats two shillings the Winchester bushel, and potatoes one shilling and threepence the hundred weight. The average price through the year is threepence-halfpenny *per* pound of twenty-six ounces for beef, veal, mutton, lamb, and pork, of the best qualities. The price of a roasting pig is four shillings, of a goose two shillings, of a turkey two shillings and sixpence, of a duck tenpence, of a hen one shilling, of a chicken eightpence, of butter tenpence *per* pound of twenty-four ounces.

PUBLIC

PUBLIC AND PAROCHIAL ROADS.

ALL the roads were originally made by the statute-labour. But in that way they were not half made, nor half kept in repair.

In the year 1777, an act of parliament was obtained for this county converting the statute-labour into money, to be paid by the actual occupiers of land, at a rate not exceeding twelve shillings sterling for the hundred merks Scots of valuation, and at a certain sum to be paid by the possessors of houses in towns and villages. Houses at a yearly rent of 15s. or under, and those occupied by persons on the poor's roll of the parish, are exempted from payment of road-money.

In some districts of the county where, from the nature of the country, or from the quality and distance of the materials, the making of roads is more expensive, the occupiers of land have been assessed to the *ultimum*; and in others where, from opposite causes, it is less so, they have been assessed only 6s. for the 100 merks Scots of valuation. Trustees are vested with the power of laying on the annual assessment, of marking out and making the roads, and of fully executing the said act. These are the commissioners of supply for the county, and such as, from the valuation of their land extending to 100 pounds Scotch, are intitled to be appointed commissioners. The whole of this assessment must be laid out on the parochial or cross roads, and no part of it on the turnpike-roads; and it is applied accordingly.

In general this money is expended with judgment, equity, and economy. The trustees, so far as I have access to know, pay all the expences of their meetings out of their private pockets. Some persons, however, are dissatisfied

with the application of the money in particular parts, some of them perhaps with, and others without reason.

The tenants on parts of some large estates far distant from the residence of the landlord or his factor, and several small proprietors, who occupy their own lands, but not possessed of land valued at 100 pounds Scotch, are not trustees, and often complain that the parochial roads in their neighbourhood are neglected. They are dissatisfied, but they will not take the proper and easy method of obtaining redress of their grievances if they are real, or to have their allegations refuted, if imaginary.

Probably their roads are neglected because, no commissioner being particularly or personally interested in them, their real situation is never stated to a meeting of trustees; and hence, not through intention, but through want of information, they are neglected by the trustees. In this case the tenants, in a body, should state the situation of their roads to their factor or landlord, and request of them to attend to their interest at the meetings of the trustees: and the small proprietors or portioners of land should state their case in the same way. Thus every real grievance would be redressed without delay or expence.

But, perhaps, in some of these cases it would appear, on a proper investigation, that the roads which had not been completely made are bye roads, frequented by few travellers; and therefore they ought not to be particularly attended to, until the more public and frequented roads in the parish should have been put into a proper state: or, perhaps, it would appear that these persons, not attending to the smallness of the annual assessment, and the great extent of roads in the parish, have taken it into their heads to imagine, that the parochial funds are sufficient for making all the parish roads as good as turnpike ones; whereas, in fact, their roads,

as well as all the others in the parish, may have been put into as good a state of repair as the funds could allow. I know some parishes in the county, in which there are nearly twenty miles of roads, and not 181. sterling of annual assessment both to make them and parochial bridges, and to keep both in repair. Every person who knows the great expence of making roads and of keeping them in repair, now when twenty times the number of wheel-carriages travel upon them which did forty years ago, must be sensible that so small a sum laid out in the most favourable situation with the greatest skill and economy, will make a very poor figure on so great a tract of road.

In these cases let the annual assessment be brought to the *ultimum*; let the complainants and all others have better roads, and let them cheerfully pay their proportion of the legal additional expences of making them such. Let the *ultimum* be continued until all the parish roads are once completely made; and then let the assessment be reduced by the trustees to as small an annual sum in each district as will merely keep the roads in it in sufficient repair. That the necessary additional sum may not fall unequitably and heavily upon the present tenants, it should be mostly paid by the landlords, and gradually repaid to them in small portions by the tenants during the succeeding leases.

This act of parliament for converting the statute labour into money to be expended on parochial roads, also contains a law appointing three lines or districts of turnpike roads in the county. The first from Graitney, within a mile of the border of Cumberland, by Lockerby and Moffat, to the march of the county with the counties of Peebles and Lanark; the second from Dumfries, by Lochmaben to Moffat; and the third from Annan to Crannell Path-Foot, in the road between Langtown and Langholm. This act commenced

at Whitsunday 1777, and was to continue for twenty-one years after, and to the end of the then next session of parliament.

A second act of parliament, which commenced on the first day of June 1789, and is to continue for twenty-one years, and to the end of the then next session of parliament, appointed an extensive line of turnpike road from near Graitney, at the march of Cumberland, upon the river of Sark, by Annan and Dumfries, and by the bridge over the river Nith at Dumfries, the bridge over the water of Clouden, and the bridge over Nith at Auldgirth, towards the burgh of Sanquhar, and by Sanquhar to the confines of the county of Dumfries, where it joins the county of Ayr, towards Muirkirk, and also where it joins the said county towards New Cumnock, and the road from Corseñarget to Wanlockhead. This road leads to Edinburgh, Glasgow, and Ayr, and also towards England and Portpatrick, and consequently opens up the great communication between this county and every part of this island and of Ireland.

In the greatest part of the line between Dumfries and Annan it is divided into two branches, for the better accommodation of the county and of the public at large. The northmost one is two miles and three quarters shorter than the other, from the point where they separate at Colinn to that where they unite again at How's; but then there are more hills in it, though none of them are very high.

To obtain a long tract of very level road in nearly the shortest line, through a very mountainous country, between the Auldgirth bridge at Blackwood and the town of Sanquhar, two very high and hard rocks are cut down, and the road is carried through them.

On all these lines of road the tolls are moderate, and yet they pay tolerably well for the money expended on these roads,

roads, excepting on that from Annan to Crannell Path-Foot, which passes through a country where the materials are distant and bad, and which is not much frequented by travellers from a distance; but it is of much utility to the country through which it passes.

The great turnpike road from Cumberland to Ayr through this county, meets with the great military road from Portpatrick through the shire of Wigton, and the stewartry of Kirkcudbright, at the bridge of Dumfries over the Nith. At this great thoroughfare from England, Scotland, and Ireland, on the march of two populous counties, and the entrance into Dumfries, the county-town; and a great weekly cattle-market, the concourse of people, of carriages of all kinds, and of cattle, is so great, that the old bridge is, by far, too narrow for their convenient or even safe passage. A strong, spacious, convenient, and elegant bridge over the Nith, about one hundred yards up the river above the old one, was finished in the end of August last in this year 1794. The new roads to each end of it will be finished in a few months, when the communication by that bridge will be fully opened, greatly to the advantage of the country in particular, and of the kingdom at large.

To prevent any other tolls from being levied upon it than the old custom, which belongs to the town of Dumfries; the county of Dumfries, the stewartry of Kirkcudbright, and the town of Dumfries, gave each 1000*l.* sterling; a considerable number of noblemen and gentlemen, proprietors of land in the county and stewartry, subscribed among them about 1500*l.* for building the bridge and making roads to each end of it; and Government hath given a grant for a considerable sum towards payment of the balance of the whole expences.

Both

Both the turnpike acts are executed by the same trustees. Upon the whole, the turnpike and parochial roads in this county are well attended to by the trustees, have been greatly improved for the last sixteen years, are of much utility to the country, and at present in as good a state as the roads in almost any county in the kingdom.

However beneficial turnpike roads are to the country at large, when established upon a right plan and under good management, they are, unpopular to a considerable degree in every county at their first erection; and in many counties the opposition of the people to them hath been so strong as greatly to retard, and in some instances totally to prevent, their being carried into effect.

It is highly probable that this opposition would be totally removed by the two following things: First, That in every turnpike act there should be a provision, " That every person " who resides nearer any one turnpike gate than a third " part of the distance between it and the next gate, should " pass through the gate nearest his residence for paying the " half of the ordinary toll." As turnpike acts now generally run, all persons who reside near any turnpike gate, on an average, pay more than double the sum which others do for any benefit they receive from the turnpike road, as, in their ordinary transactions, and in their intercourse with their nearest neighbours, they very frequently pass the gate nearest them when they have not occasion to travel a mile or two, and often not 400 yards upon the turnpike road. And, secondly, " That the trustees should always act, as they are in " law, as trustees for the county at large, as well as for the " subscribers to the turnpike road; that they should never wan- " tonly shut up other roads which are of importance to the " country, nor use any oppressive methods to compel persons " to travel on the turnpike road only." They should ever re-
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remember that turnpike roads are made for the country, and not the country for them; and that no man in a free country will easily submit to illegal or inequitable compulsion.

Let the turnpike roads always be kept in the best possible repair, and then every man, finding it his interest, will cheerfully pay for good roads rather than travel free on bad ones. In levying tolls, as well as in laying on taxes, two added to three does not always make five. In both cases there is often an excess which defeats its own end, and diminishes instead of increasing the annual revenue.

In forming a road from one place to another, the great object is not to fix upon the straightest line, which must be the shortest. This, *ceteris paribus*, certainly is the best. But it is to choose that line on which the same horses will travel in the shortest space of time from the one place to the other, and draw the greatest weight with them. The calculation must turn upon *time* and *weight*, and not upon distance. Upon this principle it must be determined when it is proper to carry a road over a hill, round its bottom, or, once for ever, to cut through a high but thin rock at a great expence. It is no advantage to the public at large, or to any particular traveller, but a great loss to both, that in travelling from one town to another there is a road four miles shorter than another, but so much more steep, that it will take him an hour longer to travel upon it, and instead of two horses he must put four to his chaise.

Of late roads are made more flat and broad than formerly, and great attention is paid to the hard and dry quality of the materials. These are all great improvements: but the first hath been carried a little too far. In a country where so much rain falls, the roads ought always to have as much declivity from the middle to each side, as to make the rain run off as quickly as it falls. The *ribs*, as road-makers term

the ditchivities on each side, should be kept very clear, and the ditches clear and deep, especially in mossy, clayey, hilly, or tilly bottoms.

THE STATE OF FARM-HOUSES AND OFFICES.

FOR the last twenty years farm-houses and offices are much improved in point both of situation and quality; but in many parts of the county they still stand in much need of improvement in both, which I hope they will gradually receive, as a taste for neatness, accommodation, and the saving of unnecessary labour, is become almost universal. Some time ago the best farm-houses were built in the form of three sides of a square: the dwelling-house formed the front, the stable and byres the second, and the barn, cart-house, and grainery, the third side. In some instances the back part, or fourth side, was filled up with shades for young cattle, and houses for hogs and poultry.

This is a convenient and beautiful form: the front of the house and the ends of the barn and stable, seen at one view, have the appearance of a house and wings. The two following are the only objections to this plan: by several gable walls, which might be saved in another plan, and by the lead gutters at the joining of the insides of the square, the expence is greatly increased; and in this country, where the wind is frequently very high, the square form of the houses occasions such swirlie-blasts, as very frequently unroot them. If large and heavy slates are used in order to resist the blast, the walls and timber must be proportionally stronger, and the expences of building greater.

To

To remedy both these evils, several farm-houses and offices are now built in a long range, the dwelling-house being at the *east* end of it. On this plan several gable walls are saved, and the swirlie-blast being entirely prevented, the houses are very seldom unroofed. As in this county the winds blow the greatest part of the year from the S. W. and bring along with them much rain and damp air from St. George's Channel, the dwelling-house should be placed at the east end of the range, as well to defend the west end of the house from that great degree of damp with which all unsheltered walls exposed to the S. W. are infested in this county, as most frequently to drive any sparks of fire which may go out of the chimney from the line of the offices, and thereby to save them from catching fire. Where stones can be got at a moderate expence, a court or yard for young cattle, dung, &c. should be inclosed with a good stone dyke behind the offices, they forming one side of the court; but the dwelling-house should be entirely out of the court, that the ground on the front and on the back of the house might be kept always clean. The farm-houses should be erected as near the centre of the arable part of the farm as possible, that much labour and time may be saved in working the farm.

THE NATURE OF LEASES.

THOUGH the hurtful practice of farmers holding lands from year to year without leases, is very common in many parts of England, it is very rare in Scotland, and scarce known at all in this county. It ought to be abolished every where.

Without security of reaping the profits of his skill and labour, what man of sense would improve his farm?

In this county leases are various with respect to endurance and stipulations; the most common lengths are fifteen, nineteen, or twenty-one years. A few are much longer, and many small farms are let upon shorter leases. Nineteen or twenty-one years is a very good length both for proprietor and tenant. A very respectable and extensive proprietor of land both in this county and in the stewartry of Kirkcudbright, grants new leases of their farms to his tenants, three years before the expiration of their old ones: this is a very good rule, equally advantageous to the proprietor, to the tenant, to the public at large, and to the progress of agriculture. When tenants do not receive a new lease until the old one is ended, for three or four years in the end of the lease they put no manure into the land but what they are strictly bound to do, and they take all the crops off it that they can.

In this way the land is so much reduced, that a tenant cannot afford to give, nor can the proprietor obtain that rent which it would have been well worth, if it had not been neglected and scoured for the four preceding years. Several years of the new lease expire before the tenant, even at the expence of much skill, money, and labour, can bring the farm to as good a state as it was in four years before the end of the last lease. In this way, a great check is given to agriculture for four years in the end of every lease, which takes as many years in the beginning of the next one to redress. Thus the tenant, by impoverishing his ground, often beggars himself, prevents the rent of the farm from rising to what it otherwise might have done, and deprives the public of much provisions, which, owing to such mismanagement, have not been produced.

But

But it is the landlord, who is the cause of all this. Security is absolutely necessary to the progress of industry. It is contrary to human nature for men to improve their farms to the end of their leases, when they have no security for a new one, in which they may reap the fruit of their industry; but the mode of renewing the lease three years before the expiration of the old one gives this security. Some are following this example. A plan so rational, equitable, wise, and beneficial to all concerned, will, I hope, soon become general; I wish I could have said universal. When it becomes general, it will carry on agriculture with an uninterrupted and progressive motion, which will bring it forward with an astonishing speed and extent.

In all improving leases, the expenditure of money should lie chiefly upon the landlord for those articles of improvement which are to be performed only once, and the article of labour should lie upon the tenant. The tenant should be bound to proper rules of management and of cropping; but the design of these should be to hinder him from doing anything more hurtful to the improvement of the farm and to agriculture, than that management and rotation, but not to prevent him from doing whatever he can satisfy his landlord is more conducive to the improvement of his farm. The rent should be low at first, and rise gradually as the improvements are carried forward. Every rise of rent should commence, not with the expenditure of the money on account of which it rises, but with the commencement of the produce which arises from that expenditure. Thus the tenant has value actually in his hand to enable him to pay the rise-rent; and therefore he does it easily, regularly, and cheerfully. In this way he is both able and willing to pay as much more additional rent as will make a very full compensation for the year's interest sunk by the landlord between

the time of the expenditure and that when the tenant reaps a crop from the improvement. In some instances plans similar to this are carrying on with success in this county.

COMMERCE AND MANUFACTURES.

VERY little commerce and manufactures have been carried on in this county. The great obstacle to the last of these was the high price of coals; this is in part removed by the late wise and popular act of parliament taking off the duty on water-borne coals imported into Scotland. But the real benefit of this act to the country is greatly obstructed by the mode of levying the fees of the custom-house officers upon the vessels in which the coals are imported. These coals are generally imported in very small vessels (or boats), but the same fee is demanded from one of these boats as from the largest vessel. That fee which on the cargo of a large vessel would make very little addition to the price of the coals, when laid on that of a boat which carries a few tons, falls heavy on each ton. If it is absolutely necessary that officers fees should be levied upon articles which pay no duty to the King, certainly, in such an article as coals, they ought to be very moderate, and proportioned to the burthen of the vessel in which they are imported. So exceedingly well is this county situated for manufactures, that from the advantage which it may derive from the free importation of coals from England, if the fees of the custom-house officers were put under a proper regulation, we may hope for the erection and success of many manufactories in it, whenever this country shall be blessed with an honourable and permanent peace.

In Dumfries and Annan, wines, rum, iron, and timber are imported, but to no very great extent. Coals, sugar, salt, and sundry other articles of merchant goods are imported in the coasting trade; and large quantities of barley, oats, oatmeal, and potatoes are exported to the markets in England and in the west of Scotland. Commerce and manufactures have always a beneficial influence upon agriculture, as they open markets for the consumption of the fruits of the ground.

SOCIETY FOR AGRICULTURE.

A VERY respectable Society for the Improvement of Agriculture was instituted in Dumfries on the 3d day of April 1776, which continued, with considerable advantage to agriculture, for several years: at last, owing to what cause I cannot say, perhaps to the combination of many causes; it dwindled away; but its beneficial effects became permanent, and are still visible in the county. The principal proceedings of the Society were printed; I have a copy of them by me, which I intended to have sent along with this paper to the President of the Honourable Board of Agriculture, but I understand he hath received one from another hand.

IMPROVE.

IMPROVEMENTS TO BE SUGGESTED IN
REGARD TO THE STOCK AND HUS-
BANDRY.

THE people in general have a turn for improvement, which is increasing, and will, I hope, soon become universal. The proprietors of land should give great encouragement to this spirit. He who hath most improved his farm should not be raised by auction, at the end of his old lease, to an extravagant rent for that farm which owes its superior value to his superior skill, industry, money, and confidence in his landlord; he should always have the first offer of a new lease at a fair and equitable rent, unless there is something very exceptionable in his character. By this mode of treatment, which is fair in itself, and highly beneficial to the landed gentleman, the spirit of improvement, stimulated by honour and interest, would soon become universal: then the great contest among farmers would be, who should improve his farm most, and have it in the highest state of improvement at the end of his lease, then a perfect confidence and harmony would subsist between the tenants and their landlord, and each would rejoice in the prosperity of the other. That landlord who cannot behold the prosperity of his tenants without regret, ought not to have tenants; and those tenants who behold their opulent landlords with an envious eye, ought not to have farms.

To improve both the crops and the stock of the county, much wet land should be drained; the various rivers, in many parts, should be banked off the adjoining low (or, as they are called, *holm*) lands, wherever this is practicable at a moderate expence; and the farms should all be inclosed and subdi-

subdivided into proper parks, with sufficient fences. No grain should be sown upon any ground but such as is in a state fit for bearing *a good crop*. Land that will not bear a good crop had much better be fallowed, or, if that cannot be done, had much better lie in grass, bad as the pasturage will be, than be cropped when the crop will not pay seed, labour, and rent. I have often seen such crops, and as often the farmers, who raised them, reduced to a state of as great poverty as that of their land.

Many of the farmers overstock their pastures, partly for want of inclosures, and partly for want of plan: they feed their whole stock of horses, milch cows, young cattle and sheep together, and always over the whole pasture every day through the year. I do not mention fat cattle, for in this way they can fat none. In this way they do not improve their stock half so much as they might do on the same land, nor make half the sum of money of them per year that they might have done. It is not from the length of time that cattle are fed, but from the degree of improvement that is actually made upon them that the profit of feeding must arise. If a park will graze sufficiently twenty bullocks from June 1 to November 1, the farmer will, in ordinary years, clear thirty guineas for feeding these; but if he had kept twenty-six in the park for the same time, they would have improved so little, that at the end of the five months he would have found it difficult to have cleared thirteen guineas for feeding them. Thus by overstocking, he would have lost seventeen guineas, and the interest of the price of six bullocks.

The same park will actually produce much more grass through the season when only twenty cattle pasture in it than when twenty-six feed in it. This may appear paradoxical to persons not accurate in observing facts or in tracing their

L causes.

causes. The fact I have often observed; and its causes, when stated, will appear very obvious to the intelligent and attentive. All dry lands, when laid out to grass for several years, have a great tendency to produce mists (fog as it is called), especially if they have not been laid out very clean and rich. When this fog obtains the ascendancy over the grass, it checks its growth so completely, that the field yields almost no grass at all. But the principal cause of fogging, as it is called, is the overstocking of the pasture. All the different kinds of vegetables that grow in the same field naturally render dwarfish those which they overtop. Fog and the grasses on which cattle feed have a tendency to choke each other. As grass naturally grows faster and higher than fog, which creeps on the earth, grass would always predominate if the land were rich enough to bear it, and if an unnatural check were not given to it. While, therefore, the pasture is not overstocked, the grass overtops and checks the fog; but if the pasture is overstocked, the grass is kept down by the cattle, and is soon covered and choked by the fog. Hence an overstocked pasture produces very little grass, because it is overrun with fog. To cure old grass ground of fog without ploughing it up, some gentlemen turn the field into hay for one or two years, if it is rich enough to force up a crop of hay, and by thus shading the fog by the thick and tall grass, to choke and destroy it. But if the pasture had been kept rank every year, the fog would never have risen to any height.

There is another cause, equally powerful, which makes a rank pasture produce more grass than a bare one. All vegetables grow more slowly when they are in an early stage and small; when they become larger, and the blade is large and soft, they grow much faster; and when the blade falls, the surface contracts, and the stalk forms and hardens for.

for the seed ; they again grow much flower, and gradually, die of old age. This is, in fact, the case with all the corns and grasses which this island produces : and the natural reasons of these different degrees of growth, in the different stages of the plant, must, when stated, be obvious to every intelligent person. Every plant is fed partly from the earth and partly from the air. Hence its growth is most rapid when it is in the most fit state for receiving the most abundant nourishment from both these sources at the same time. When the roots are small, and even though they should be large, when the plant itself (the graft) is small, its tubes are proportionally small, and therefore the quantity of vegetable food forced through them from the earth must be small. While the grass is small the surface, exposed to the air, must also be small, and consequently less vegetable food can pass through its few and narrow pores, from the air, to feed the plant. When the plant and blade become large, and at the same time continue soft and spungy, its large tubes at once receive a large quantity of food from the earth, and expand to receive any quantity which the roots, in their more vigorous state and extensive range, collect from the ground and force into them ; and the greater extent and porosity of the blade open more and larger avenues for attracting and conveying food from the air to the plant.

But when the blade falls, when the stalk forms, when the surface and fibres contract and harden, and especially when the joints harden (knots as they are called), which are necessary to give sufficient strength to the stalk to support the head or seed, the contracted tubes can convey less food from the earth, and very little from the air can penetrate the contracted pores of the hardened surface. In this way, hardening and contracting, the plant goes on

until it dies of hunger, or rather of old age, because its superannuated vessels cannot receive food from either earth or air, nor digest any. To bring the grass therefore to, and to keep it as long as possible in, the second stage, is the natural way of making the field produce the greatest possible quantity of grass, *ceteris paribus*. But this is done by keeping a rank pasture. On the one hand, the pasture should never be bare, otherwise the grass is in the first stage; and on the other, the grass should never be allowed to *spindle*, as it is called, or to form into the stalk for running to seed, otherwise it would be in the third stage.

And a third cause is, that a bare pasture holds out a bare and uncovered surface of ground, exposed to all the inclemencies of the weather in this variable climate: in hot, dry weather it is scorched; in cold weather it is chilled; and in very wet weather the rain, passing rapidly through the soil, and carrying the finest particles of it beneath the range of the grass-roots, makes the plants turn yellow and feeble for want of solid food; or, as the country farmer expresses it, *scalds the grass*: but a rank pasture, giving a good cover to the ground, equally shelters it from the scorching heat and the chilling cold; and imbibing much of the rain, and entangling more among its matted blades in its progress downwards, makes it filtrate through the soil with a motion so gentle, and in portions so divided, that, in the most rainy weather, it seldom scalds the grass. In all these varieties of weather, the bare pasture is much hurt for want of cover, and the grass catches a disease, from which it does not fully recover for a considerable time after the weather takes a favourable change; while the rank pasture, sheltered by its own thick coat, is very little affected by them. Besides, a good cover of grass keeps up a moisture, a stagnation of air, and a fermentation at the bottom of the grass, which softens the

the surface of the soil, and greatly stimulates the vegetative qualities in it.

Every kind of cattle should be kept in parks by themselves; such as horses, sheep, milch-cows, fatting cattle, and young cattle sorted according to their different ages. Open heifers should never go in the same park with bullocks. Each set of cattle should have two parks, as nearly equal in extent and quality as can be got, and well watered; in which they should pasture alternately, for three weeks at a time, through the whole season. After Lammas, the horses and cows should change pastures for a short time, to eat up what is called *the rath*, or the luxuriant grass that had grown on those parts of the pasture where they had dropped their dung.

OBSTACLES TO IMPROVEMENTS, AND THE WAYS FOR REMOVING THEM.

THE following are the principal obstacles to improvements. First, *the game-laws*, or at least *the mode of hunting*. In the neighbourhood of towns chiefly, a number of idle and thoughtless persons, many of whom have no other qualification than an aversion to industry and regularity, by themselves, their horses, their dogs, and their followers, break or pull down dykes (for few of them ride *horses qualified* to leap clearly over them); throw open gates, or, if the farmer is so *unmanly* as to have them closed when they return, lest his cattle should destroy his neighbour's corns, break them to pieces, to teach him *better breeding*; gallop over, greatly poach, and trample down the young wheat and sown grasses; even trample down the growing corns, if the season and the farmer

have

have not been *so polite* as to have had them ripened and cut down before the shooting season commenced; terrify their sheep and black cattle out of their pastures; and thereby often so much *raise*, that is, render furious, the black cattle, that they will not feed calmly for several months after, and in that *raised* or furious state cannot be driven with safety to the English markets. These may be sport to the sportsman; but they are great losses, serious evils, and gross injuries to the honest and industrious farmer.

To remove this obstacle, if it shall still be thought necessary to continue the game-laws, some such alterations as the following should be made in them:

“ The commencement of the shooting and hunting season
 “ should be so late, that the grain in Scotland should *all be*
 “ *cut down* at least. Even a qualified gentleman should not
 “ shoot or hunt upon any ground which he does not actually
 “ occupy himself, without a written permission asked and re-
 “ ceived from the *occupier* of the ground, whether he is pro-
 “ prietor or tenant of it; and that under a heavy penalty, to
 “ be paid, the one-third to the public prosecutor, and two-
 “ thirds to the person whose farm hath been injured without
 “ his own consent. It should be considered as highly disho-
 “ nourable for a sportsman to curse, swear, or give insolent
 “ language, when in the chase he pretends to keep company
 “ with gentlemen. And the Procurator Fiscal for each county,
 “ should be obliged to carry on the prosecutions against trans-
 “ gressors of this law, at the public expence, and in his own
 “ name, whenever he is furnished with a list of injuries done,
 “ and of witnesses to prove the facts, and the designation of
 “ the person or persons who have done the injury, by the per-
 “ son whose farm hath been injured.”

In the second place, boon or *bailey* work, as it is called, paying public burthens, fowls, or other casualties, by the te-
 nants,

most, are great obstacles to agriculture; and are much more hurtful to the tenant and to the public than beneficial to the landlord. Tenants are not so stupid now, but if they pay these articles, they will take care, at taking their lease, to become bound to pay as much less money rent as will compensate for them.

But this is not the worst of these articles. Boon-work of every kind is performed in a manner so very slow and slovenly, that it would be much better for the landlord to pay the ordinary wages of the country, to have his work done soon and well, than to get it done for nothing by his *boon-bearers* or other boon-workers. The tenant also loses much. He may be called away to cut his master's corn when his own is shaking or rotting, and when, by one day's absence from his farm, he may lose more than would pay the wages of twenty days, while his landlord does not reap half of a day's advantage from his slovenly work. By paying, at different times and places, the land-tax, the road-money, the minister's stipends, and the schoolmaster's salary, the tenant is exposed to much waste of time and expence, and even to tippling and drinking, by meeting with numbers of his fellow-farmers on these occasions. It is much easier for the proprietor to pay *at once* for all his lands that lie in one parish or county. He would thus save much time and expence, not only to his tenants, but also to the receivers of all these public burthens.

To remove this obstacle, all these articles should be taken off the tenants.

Thirdly, The general inattention of tenants to keep their houses, dykes, ditches, and hedges, in a constant state of repair, is a great obstacle to improvement. None but a person who hath frequent access to see the actual state of the country, could believe it possible that tenants could be so grossly inattentive to their own convenience, interest, and character, as they

they are in this respect. One *slop* or *breach* in a dyke, which might have been built up for sixpence, renders an inclosure as ineffectual for confining cattle, as if there were no dyke at all around the field. When cattle, from the custom of going through these fallen parts from one field to another, acquire the habit of ranging from one inclosure to another, they scramble over and break down almost every dyke that opposes their ranging habits. To remedy this evil, and to oblige tenants to do justice to themselves, their landlords, and the country, they should be bound in strict and unequivocal terms, under heavy penalties, to keep their houses and *fences*, *at all times, in a state of good repair*; and the landlords and courts of law, in their respective spheres, should strictly enforce that obligation.

Fourthly, Intailed estates greatly retard the progress of agriculture. Some law, more favourable to the improvement of such estates than any which yet exists, should be made, to which all tailzies should be subjected.

Lastly, The greatest of all obstacles to improvement is *Thirlage to milns*.

Thirlage is when corns that had grown upon certain lands, or had been brought unto a certain district, must be manufactured at the miln to which they are thirled, and pay certain multures and sequels. It is of three kinds.

1st. Of *grana illata et invecta*. This exists in a very few royal brughs only, and has little effect upon agriculture. It rather affects the inhabitants of the particular brugh, as it lays an additional burthen upon the grain which comes within the jurisdiction of the brugh, that must ultimately increase the price of meal to the inhabitants.

This, like many ancient grants to or customs in brughs, defeats its own end, and injures those very brughs it was originally intended to serve. The farmer will not carry his grain

grain to those towns which impose extraordinary taxes upon it, unless he is certain of receiving there, an extraordinary price to compensate fully these burthens.

2d, Of the *grindable corns*. This is when all the corns that grow upon the thirled land, *that the occupier actually grinds into meal*, must be ground in the miln to which it is thirled, and must pay a certain multure and navechip. In some baronies the multure is the eleventh part of the grain, or shelling ; and the navechip is the twenty-fifth part of the meal after the multure had been taken off. Hence the amount of this burthen is fully the eighth part of the whole grain manufactured.

And 3d, Of *omnia grana crescentia*. This is when all the corns of every kind that grow upon the thirled land, feed and horse-corn only excepted, pay both the multure and navechip, even though they should be *sold unmanufactured*. And thus the whole eighth part of the produce of a corn farm, every year, must be paid to the proprietor or tacksman of the miln. This last kind of thirlage, to my personal knowledge, hath already given a great check to agriculture, and in a short time will put a complete stop to it in every district where it exists. The justness of this opinion will appear to every candid and intelligent person from the following state :

	f. s. d.
Suppose an acre of oats worth	- - - - - 6 0 0
Deduct a third part for seed and horse-corn, being	
the common allowance in thirled lands,	- - 2 0 0

From which deduct an eleventh part for multure,	4 0 0
and a twenty-fifth for navechip, making together	
an eighth part of the whole,	- - - - - 0 10 0

M	Carry over 3 10 0
	Brought

L. s. d.

Brought over 3 10 0

From which deduct the expences of labour, viz.
ploughing and harrowing only 7s. as corn is al-
ready allowed for the horses; cutting down 5s. 6d.
threshing and dressing 5s. 6d. carting-in, stacking
up, and carting the corn to the markets, at 5s.
in the whole - - - - L. 1. 3. 0

Sixty single cart-loads of dung, with
cartage, at 1s. exhausted in three
crops, and therefore the third part of
it to be charged on one crop, - 1 0 0

— 2. 3. 0 —

1. 7. 0

Thus only one pound and seven shillings sterling *per year* is
left of clear profit.

But the grain of land laid down, when in such a state of
richness as to bear a crop of corn worth six pounds sterling,
would pay more than one pound and seven shillings yearly,
per acre, to the farmer, always in pasturage: and as no la-
bour is bestowed upon pasture ground, in proportion as the
country increases in riches, the clear profit on the corn-crop
of such land would diminish, because the expence of labour
always increases with the riches of a country. Thus the
reason for not ploughing such land would gradually become
stronger, and at last irresistible.

Another objection to *thirlage* is, that it operates like all
monopolies. By preventing all competition, they always di-
minish the intrinsic worth, and increase the price of the com-
modity. Exactly similar is the case with milns to the district
that is thirled to them. The proprietor or tackman of the
miln, knowing that the persons whose lands are thirled to it,
dare

dare not carry their corns to any other mill, unless they also pay him both the multure and navieship, is at no pains to improve the machinery, to keep it in good repair, or to serve them expeditiously and well.

Hence, in fact, such mills in general are of a worse construction, in a worse state of repair, and produce much less meal from the same corn, than other mills in the country which do not depend on a thirlage for their employment. Whatever is lost by these monopoly mills in the manufacturing, is lost to the public and to the farmer, and is an additional reason to him for preferring the grazing to the cropping of such land. The calculation is equally true and exact, whether the crop, *per acre*, is worth 6, 3, or 10 l. because the value of the grass will be in proportion to the state of the ground at the time it is laid down to grass. And to calculate fairly, the ground must be in the same state of richness as it was when the crop of grain was sown upon it on which the calculation proceeded.

And a third great objection to thirlage is, that it takes the farmer off from his work to attend multure courts, whenever the baron-baillie is pleased to appoint them; that it excites and keeps up a spirit of contention between the murtherer and the persons whose lands are thirled; and that it has a strong tendency to destroy, in many, all just reverence for an oath.

When those who occupy thirled land sell any of their corns a-ground, which must often happen in every barony, the baron-baillie, at the petition of the murtherer, holds a multure court: the murtherer commonly libels them for much larger abstractions than they have sold, or even than he believes they have sold; and without any proof of the quantity on his part, they must either pay the amount of that extravagant and unjust libel, or *deponer* to the quantity of grain which they have sold.

Many of the small country farmers, who keep no regular books, cannot recollect for a whole year, or, as is sometimes necessary, for several years, every bushel of grain that they had sold; and some others, we may suppose, there may be in every large district, who, when the sum they have to pay is to be regulated by their own oath, may be tempted by self-interest to swear falsely. In this way a due reverence for an *oath* is destroyed in many. This state of mind, and the custom of contending with the multurer, gradually form in them those habits of dissatisfaction, of contention, and of insensibility to the sacred obligation of an *oath*, which, in process of time, may discipline them to disturb the peace of society itself, when they fret under grievances, and when the strongest bond of society hath lost its hold of their mind.

Sometimes I have known multure courts held in the hurry of harvest, when all the farmers were obliged to leave their most necessary harvest work to attend the court, lest decrets should have been passed against them in absence for the whole amount of the false libel.

Some proprietors of milns have only the tenants of their own lands thirled to them. When this is the case, the grievance is easily removed. So soon as the leases of the milns and lands expire, they can take off the thirlage by their own voluntary private deed. By doing so, they will greatly promote the interest of themselves, of their tenants, and of society. The tenants will cheerfully give much more additional rent for their farms, than will compensate for the reduction of rent upon the miln; and the tacksman of the miln, grinding for the $\frac{3}{2}$ d part of the meal, will be better with his reduced rent, than he was when, receiving the multure, he paid a much higher rent. Several very respectable gentlemen in Scotland, influenced by such considerations, have cleared all their own tenants of thirlage; and I am persuaded, that, in a few years, every gentleman,

gentleman, whose tenants are thirled to his miln, will see it much for his interest to follow their wife example.

But the thirlage which is the greatest grievance, and the most difficult to be removed, is that, where the miln is the property of one gentleman, and the lands that are thirled belong to other gentlemen. In this case, which is very common in this and in many other counties in Scotland, the proprietor of the miln will not sell the thirlage; because, though it is a grievance, it is one not upon him or his tenants, but upon other proprietors and their tenants. Or perhaps he *cannot sell the muckles*, however willing he is to do so, and however clearly he sees that all thirlage is a great obstacle to the progress of agriculture, because he is a minor, his estate is under a tailzie, or his miln and thirlage is under a long lease to an obstinate tacksman, who will not consent even to a bargain that is advantageous to himself.

By obtaining the redress of this grievance, the Honourable Board of Agriculture would remove the greatest obstacle to the improvement of land in Scotland; the greatest that even existed in any free country; and one, if it shall still continue, which, in spite of all their patriotic and vigorous efforts, will soon put a complete stop to agriculture in all those districts which are still under the servitude of thirlage.

The redress must come from the Legislature. Nothing but *an act of parliament* can completely remove this obstacle. I readily admit, that an act of parliament should never take away *private property*, unless when the holding it is *highly oppressive* to some individuals, or *very hurtful to the public*; and, in no case without *full compensation to the private person* for the loss of his property. From the preceding statement, I hope it is clear, that thirlage is *very oppressive* to many *private persons*, and *very hurtful to the public*. If more evidence were necessary, it might be easily produced.

But

But it ought also to be observed, that the proprietors of milns draw much more multure in fact, than in equity they have right to, or than was in the view or intention of the contracting parties, when they made the original contract. Thirlage had its origin in an early and rude state of this country, in the following manner: At a time when very little corn was raised in Scotland, and chiefly on the small crofts near each farm-house, and when that little was ground in a very simple machine, called *quairns*, driven by the hand of a man, which each family had for its own use; and when, in the ignorance of mechanics, a miln was thought the *master-piece of machinery*, no person would undertake to erect and keep up a miln, *this grand machine*, until a certain number of his neighbouring landholders should bind themselves to send all their corns to said miln, and pay such multures and navieship as they and he judged would be a sufficient compensation to him for building and keeping in repair this miln.

The spirit of the contract, and the intention of the contracting parties, were, that as this miln was erected for the convenience and advantage of *the thirle* as well as of *the proprietor*, they were not to leave this miln and carry their corn to another which might be erected afterwards in the neighbourhood; and they were to pay such a proportion of their grain for grinding, as would indemnify the proprietor of the miln for erecting, keeping in repair, and working the miln. Until within the last thirty years, these multures were no more than sufficient for these purposes, and no more than the contracting parties had in their view when they made the contract. But by the progress of agriculture for the last thirty years, they have arisen, in many parts of the country, to four times the sum sufficient for these purposes, and consequently to four times the sum the contracting parties had in view.

If it ever to be supposed, either that the one party would have had the effrontery to have asked, or the other the folly to have given, four times the sum that was right and proper, if they had seen its actual amount? Where is the man who is able to persuade landholders to thirle their lands *now* to his mill, and pay him the eighth part of all the corns which grow upon them? Many of the thirlages rose to their present oppressive height, not even from such contracts as these; but, from one *imposition* after another upon the weakness or negligence of tenants or servants, they swelled up by a mere *use and wont*. Thus by adding one oppression to another, the proprietors of mills, in many instances, at last, by the *long prescription*, established their *right* upon that *use and wont*, which was itself *a wrong*.

On all these accounts, thirlage is a private property, which of all others may be taken away with most propriety by act of parliament. The Legislature hath often taken away private property held upon a much more equitable right, and when the holding of it was not nearly so injurious to the public. Thus, both in South and North Britain, many acts of parliament have taken away lands and houses, the property of private individuals, held by the most unexceptionable rights, to make *high roads* for the accommodation of the public, when the old road would not have been a quarter of a mile longer. In many towns, the property of private persons in their houses is taken away by act of parliament, sometimes to promote the accommodation of the inhabitants, and sometimes merely to improve the police or elegant appearance of the town.

By the Jurisdiction Act, 20. Geo. 2. all heritable jurisdictions were dissolved. By act 1633, chap. 17. titulars are obliged to value and sell their teinds, at nine years purchase, to the heritors, when legally required. And in parishes where there is no titular, the patrons are obliged, by acts 1690 and

1693, to sell their teinds to the heritors (landholders) at six years purchase, excepting in those parishes where the king is titular or patron, in which they can be valued and let in lease, but cannot be sold. If titulars and patrons had not been obliged, by law, thus to value and sell their teinds, all the efforts of the Legislature, of patriotic societies and individuals, to encourage agriculture in Scotland, would be in vain. What man of sense would improve his estate at a great expence, when the titular or patron would carry off, *annually*, the fifth part of his increased rent?

Suppose an estate raised, by expensive improvements, from 100 l. to 500 l. sterling of yearly rent, in its original state the titular, for himself and the minister serving the cure, would draw from it 20 l. sterling; but in its improved state he would draw 100 l. sterling of teind *per annum*, if the teinds had not been valued or sold. Many estates have been raised in their rental, in a greater proportion, in a few years, by improvements. All this reasoning applies with equal force to thirlage, as a bar to improvement of land; with this single difference, that teinds affected all the lands of Scotland, and thirlage only some of them. These considerations ought to weigh much with the British Legislature, to remove the obstacle of thirlage, not merely because it is oppressive, and hath gone far beyond the view and intention of the original contractors, like the teinds, but also because it is *partial*, and a great check to agriculture in particular districts of the country, to which the other parts of it are not exposed.

To remove this evil, in my humble opinion, in a way most equitable and fair for all parties, and most beneficial for the country at large, an act of parliament should be passed, empowering landholders or *tenants* to compel the proprietors and *tenants* of milns to value their mulfures, naveship, and all sequels; and also, if they shall require it, to sell them, not

at six, as patrons do teinds; not at nine, as titulars do; but at fifteen years purchase.

This act should compel minors and proprietors of tailzie'd estates to value and sell their multures, &c. It should provide, that the price received by the proprietor of a tailzie'd miln should be laid out upon and for the permanent benefit of the tailzie'd estate, that no injury may be done to the heirs of entail. And in those cases in which there is a lease upon the miln, that the tackisman shall not have it in his power to stop either the valuation or sale of the multures, &c. on account of his lease; but that he shall receive, from the proprietor of the miln, an annual deduction from his rent, in proportion to the loss he sustains by the sale of all or of any part of the multures, &c. that, on the one hand, he may not obstinately prolong an oppressive servitude upon the country, and, on the other, no injury may be done to him.

To conduct the processes of valuation and of sale with the most perfect equity to all parties, and to save time and expences, they should be carried on before the sheriff or steward depute or substitute of the shire or stewardry. The valuation of the multures, &c. the deduction of rent to the tackisman of the miln, and the addition of rent by the tenants to the proprietors of thirled lands who purchase, should all be fixed by the judge, conformed to the verdict of a jury of twelve respectable persons in the county, chosen, the one half by the proprietor and tackisman of the miln, and the other half by the proprietor and tenants of the thirled lands. The half of each of these six jurymen should be proprietors of land, and the other half tenants. And an extract of said decree of sale should be a sufficient discharge of the servitude of thirlage, without any formal discharge or disposition thereof, as, for a reason that does not apply to multures, is the case in compilation of a decree of sale of teinds.

It hath been suggested, that there may be a decree of valuation, without being immediately followed with that of a sale. The reason is, that the objects in view, even the improvement of the country in agriculture, and the satisfaction of that valuable body of men, the farmers of land, who feel the burthen of this servitude, cannot be universally obtained without such a clause in the act.

Some proprietors, especially in the present state of the country, may not be able to spare money immediately to purchase their malktures, without retrenching an equal sum at least from the improvements of their estates. And some, who can spare money, may be so completely *penny wise and pound foolish*, that, because their lands are under lease for several years, and their tenants bound to pay the multures, they will allow their poor tenants to groan under the burthen which they themselves do not feel. Let such landholders be assured by one who hath examined the matter to the bottom, that by this conduct they will plant a twig to scourge their tenants and the country, which, in the currency of a fifteen years lease, will grow up to a rod to chastise themselves most completely. The longer they are of clearing their lands of this burthen, the longer will the improvement of them be retarded, and the greater price will they at last pay for their multures.

That poor landholders who cannot conveniently purchase at present, and that tenants who have leases, and whose landlords will not value or purchase, may not lie under a grievous servitude, and that the lands in their possession may not lie unimproved, to their own detriment and that of the public, it is highly proper that the clause relative to valuing should make a part of the act, and that the faculty of valuing should be given to the tenants, as well as to the proprietors of the thirled lands. For valuing without purchasing, there is a precedent in the teind law. But as no man of sense will value without purchasing.

purchasing his teinds, excepting in those cases in which they cannot be sold, so under such a law for multures, no man of sense would value without purchasing, if he could possibly raise the money ; for this good reason, that no man can lay out his money so well, as for ever secured on his own estate, at six, nine, or even sixteen years purchase.

Perhaps proprietors of milns may think sixteen years purchase too low a price for their thirlage, and the thirle may think it too high. Such is the influence of self-interest upon even the most candid minds, that the seller and buyer seldom have the same opinion of the value of the article about which they are bargaining. But, every circumstance considered, the above appears a fair and equitable price. Considering how much greater the annual amount of the multures now is, than it was at the time the parties contracted, or than the contracting parties had in their view or intention ;—the manner in which many of the thirlages have been formed or increased, without any valuable consideration, or even formal contract, by *mere use and wont* ;—the certainty that as riches and the price of labour increase in the country, the motive to the thirle to lay their land entirely into grass, or to take only crops of potatoes, beans, lint, and clover, which *pay no multures*, must increase, and thereby the miln may be entirely deprived of the multures ;—and considering the many disagreeable and expensive processes between the proprietor of the miln and the thirle, sixteen years purchase of the present annual amount is a very fair price.

And though those proprietors especially, who have either laid out their thirled lands in grass, or are preparing to do so, in order to get totally clear of the thirlage without buying it up, may think sixteen years purchase rather too high a price, yet to have it in their power to *crop* or graze their lands as they please, and to try every proper improving scheme that may

yet be suggested or formed by either the public or private friends of agriculture, they ought readily to agree to that price. Indeed a few years either more or less of purchase ought to be no object with either party, when brought in comparison with the improvement of the agriculture of the country. A few months ago, the landholders of this parish of Holywood purchased, at a much higher price, a very heavy thirlage which lay upon our lands ; and from the great advantage, freedom from that servitude will be, to their improvement, we are fully convinced that we have done a wise thing.

To value and sell thirlage in some such way as the above, would be much more equitable than the existing law for the valuation of teinds. In the valuation of thirlage there are only two parties, and by the above plan, justice would be done to both, and the public would reap much advantage. But in the valuation of teinds there are three parties, and whatever justice is done to two of them, the titular or patron and the heritors, much injury is, in many instances, done to the third, the minister who serves the cure. By the valuation of all the teinds in the parish, the whole fund for his stipends may be fixed at so small a sum, that while, with the progres of riches in the country, his *necessary expences* increase to a sum far beyond the amount of his stipends ; even the *friendly court of teinds* cannot augment his stipend for want of funds. Several parishes in Scotland are already in this situation.

CONT

(102)

CONCLUSION.

IT is proposed to conclude this Report with the following general observations:

1. In countries where the land is allowed to lie in grass for several years, ground of a light, dry, and warm soil, is very much infested and overrun with broom; and that of a strong, dry, but colder soil, with whins (furze), as they are called. The general opinion is, that though the pasturage is totally destroyed, in many parts, by these noxious shrubs, yet it is not possible to keep such lands clear of them, when they lie several years in pasturage. This is an erroneous opinion.

These shrubs partake of the nature of *trees* because they are *timber*, of that of *root-weeds* because they are propagated from the roots, and of that of *seed-weeds* because they are also raised from the seed. Their seed is of that kind which, when buried in the earth, preserves its vegetating qualities for several years, and when it is brought again within the influence of the air, springs up to shrubs which bear and shed abundance of seed, and cover the whole adjoining fields with young plants.

Hence, to destroy these shrubs completely, that method must be used first which has the most natural tendency to destroy *trees* and *root-weeds*. In this climate, where we have the heat of summer and the cold of winter, all trees, by the wise appointment of Divine Providence, collect and contract their vegetable juices, as necessary to the preservation of the vegetable life, as the blood is to that of the animal life, from their branches and trunks into their roots, in the chilling cold of winter, to keep them warm under the ground; and with the returning heat of the spring and summer, they force

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These nutritive juices from the roots up to the trunk, the branches, the leaves, and the seed, or the fruit, to make them flourish and grow.

Evergreens, of which species broom and furze are, never so completely compels their juices into their roots as other trees or shrubs do; but it is probable that they force their juices as completely into their trunks and branches, in their seasons, as other trees do. Almost every particular species of tree has its own particular season, when the greatest quantity of its vegetable juices is forced into its trunk and branches. The time when it is in this state is also much regulated by the nature of the soil and shelter in which it grows, and the state of the climate and of the weather. The more early these are, the sooner will the greatest quantity of juice ascend to the trunk and branches.

Every person may know, by ocular inspection, when a tree is in this state: it is when after the leaves have all come to their full size, the annual shoot of the tree hath come to its full length, thickness, and firmness, the flowers are falling, and the seed is forming. All persons who sell or buy woods know that all the kinds of trees which *stole* or spring again from the *old root*, must be cut when the juices are mostly down in the roots, otherwise they would not spring again. These kinds of trees are therefore cut in *winter*, and for that reason are called *winter-wood* by the dealers in woods. The oak is cut for its bark as well as for its timber, and where the trees are small the bark is of much more value than the timber. The bark will not peel from the tree unless a considerable quantity of juice hath got up to the trunk and branches; or, as the wood-dealers express it, *until the sap is up*; but if the roots were nearly exhausted of juice when the tree was cut, no young trees would stole or spring from the *old root*. Hence, in cutting oak woods, the buyers are restricted

stricted from cutting after a fixed time in the season. If any person wishes totally to destroy trees without the trouble of digging out the roots, he should cut them down when the seed is formed upon them; and then the roots which remain in the ground, drained of their vegetable juice, would be unable to shoot forth new stoles: they would as certainly die as an animal would when all its blood had been drawn from it.

In this way, broom and furze should be treated, that they may be destroyed. When their blossoms are faded, and their seed is forming, they should be hoed out. In hoeing them, there is one particular part of the root which should be cut with the hoe, both for the easiness, expedition, and cheapness of the work, and for taking out the root more completely. These shrubs send down one great perpendicular root deep into the ground, and from the upper part of this one, many small roots spread out horizontally, in every direction, a very little below the surface of the ground, from which a great number of small bushes spring up. The great perpendicular root should be cut a little below the part where the horizontal ones spread out from it, which, with a dexterous hand and a good sharp hoe, may commonly be done at one stroke; the hoer may then, by the principal trunk, or *stalk*, pull out of the ground, in one connected body, all the small collateral roots, with the bushes adhering to them; then only the top of the perpendicular root will remain in the ground, which, from its perpendicular situation and straight shape, will not interrupt either plough or harrow, and from its want of vegetable juice will soon totally die away.

In this way all the broom and furze of the field, so far as they are in the state of trees or root-weeds, will be destroyed. And if there were no seeds of these shrubs in the soil of the field,

field, or if none were carried into it by the wind, by birds, or by any other means, not a single one would ever grow up again, except from those roots which either had not been properly taken out, or had been so much later in their growth than the others, that the principal part of their juice had been in their root when they were hoed. The few that had escaped might be destroyed in the same way in a subsequent year, when they should make their appearance above ground.

But in every field overrun with these shrubs, the soil is full of the seeds, which they had shed in abundance for many years. Every person, who hath observed these shrubs, must be sensible that they bear a very great quantity of seed annually: of that seed a considerable part, especially before the field is completely covered with these bushes, falls in situations where, by the free operation of the air, it vegetates and covers the field. Thus it is, that these noxious shrubs make such rapid progress over pasture-land. But after there are many thickets of these, the greatest part of the seed falling on the ground at the roots of these thickets, and shaded from the influence of the sun and air, lies in an unvegetated state for years, until it is freed from the shade, and brought into a situation favourable for vegetation.

After the bushes are destroyed by hoeing, if the field is ploughed for crops, as is commonly the case, many of these seeds vegetate, and appear in multitudes of young plants among the stubble in harvest. Next winter many of these are buried so deep by the ploughing, that they die like feed-weeds when ploughed down in a fallow; and so on, in like manner every year the ground is in crop, more of the seeds are made to vegetate, are ploughed down and destroyed by the culture of the field, like feed-weeds by a fallow, until all the seeds in the field are greatly exhausted. After a course

course of cropping the field is laid down to grass. In the first year of the grass several young plants will appear, chiefly in the sides of the furrows. By the last ploughing of the field, any of the seeds which happened to lie on the ridges were mostly buried by the furrow that was ploughed close upon the back of the one on which they lay: thus lying buried so deep during the years of grass, they entirely rot away; but no furrow being laid upon the back of the last furrow of each side of the ridge, the seeds, which happen to be in these parts of the field, are left in the most favourable situation for vegetating. The few plants which spring up the first year of the grass in the sides of the furrows, form the granaries from which, in a few years, the whole field is sown with the seeds and covered again with the bushes of these shrubs, in the present management, or rather mismanagement, of such lands.

To clean the field completely, these young plants should be pulled out of root by the hand the first year, before any seed forms upon them; they will be pulled very easily. The second and third years a few more will appear, which should be pulled in the same state and way. Every plant thus pulled is completely destroyed, and the many thousands, which in a few years would have been propagated by its seed, as completely prevented. After the third year very few plants will appear, though the field should lie in pasture for any number of years. To pull out with the hand these young plants, in most grounds, will not cost above eight-pence per acre for each year, on an average of the three years.

This theory is strictly philosophical, and, like every *true* theory in natural philosophy, stands the test of experiment. In the years 1774 and 1775 I managed in this way, and laid down in grass, two parks, for the purpose of getting old rich grass for my milch cows. Before I began to cultivate

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them, some parts were perfect thickets of furze, and others of broom. They are still in pasturage, and have always been so since these years, without being in the least degree molested by either of these shrubs.

If a gentleman has a lawn, or other field, overrun with these, which he does not wish to plough, it may be completely cleaned of them; first by hoeing in the manner above described, and then by hand-weeding, for a few years, the young plants which will spring up on the hoed ground. To give the hoed parts a green surface as soon as possible, grass seeds should be sown on them in showery warm weather, and rolled in on a fair day, and when the soil is dry on the surface.

2. Some years ago an additional duty was laid upon malt, by which much hurt hath been done to the comfort, to the health, to the morals, to the industry, and to the good order of the lower ranks of the people; and a great check will be given to the population of the country. Before that time, not only the country gentlemen and farmers, but also the tradesmen, labourers, and cottagers, brewed good wholesome small-beer, in their own houses, for their private use. This was not used as a luxury by these cottagers, but as a very valuable and substantial necessary of life.

Like porter to the London porters, it was their drink, and the half of their meat. But since the additional duty upon malt, not the tenth part of it is used in the families of gentlemen and farmers that was formerly; and the poor cottagers never taste ale. Their situation is thus rendered truly pitiable. Having no cows, and the farmers either sending all their milk to the neighbouring towns, or making it into cheese, they cannot purchase for money milk to themselves and their young children; and they cannot now afford, as formerly, to brew their little quantities of small-beer. Those of them who

who are sober have no other beverage for themselves and their young children but the limpid stream; a wholesome drink indeed to the *gentleman* who eats a full meal of substantial food, who does not take much violent exercise, and who qualifies it with a few glasses of generous wine; but poor nourishment to the mechanic and labourer, who having toiled hard through the day come home in the evening to a few potatoes for their scanty dinner.

But all men, either in the higher or lower ranks of life, are not sober. The high price of the wholesome beverage of ale, and the very hurtful low price of usquebaugh (whisky as it is called), have formed a most powerful and dangerous temptation to drunkenness in the lower ranks of the people. These spirits, hot, fiery, new from the still, in a poisonous state, are used by them to great excess, intoxication, and the destruction of every thing valuable; many have been killed by them in the very act of drinking, almost as quickly as they would have been by a dose of arsenick. Others, whose constitutions were stronger, or whose whisky was older, have stood the test a little longer; but they destroy their health, their good order, their industry, their circumstances, their morals, and risk their souls. Having ruined their constitutions by the habit of drinking ardent spirits to excess, their posterity must be few, and a sickly race; thus "the iniquity of the fathers come upon the children to the third and fourth generation." Many, in this way, make themselves beggars, and many beggars come to our doors to ask alms in a state of the most pitiful and shocking intoxication.

So completely hath usquebaugh destroyed our ale, that, in doing so, it hath almost destroyed our bread. For want of brewing the bakers cannot get enough of yeast (barm); and necessity obliges them to make up some artificial yeast to supply its place. This composition gives their bread a damp-

ness, heaviness, and disagreeable taste, which are very unpleasant, and, I am afraid, equally unwholesome. I suspect that the high duty on malt hath diminished the revenue from that article, so far as it is employed in making ale. But supposing the case to be otherwise, what wise Government would support its revenue at the expence of the health, lives, population, good order, industry, morals, and future prospects of its citizens?

That individual, or that society of men, will do an essential and important service to their country, and to the best interests of many individuals, who shall obtain such regulations from the British Legislature as shall render small-beer attainable, and usquebaugh unattainable, by the lower ranks of the people. Such regulations may be formed to accomplish this important purpose, as will increase instead of diminishing the revenue of Government.

3. Many thousand pounds have been lost, at many different times, by the gentlemen and farmers in this and the neighbouring counties of Kirkcudbright and Wigton, by the bankruptcies of dealers in cattle (drovers as they are called). Several persons of very small original capitals buy large quantities of black cattle, yearly, in these counties, which they drive to the markets in the south of England. The principal drovers buy each above 30,000 pounds sterling worth of cattle yearly: these they purchase from the gentlemen and farmers on bills of ninety days: the drawers, commonly having immediate occasion for the money to pay their rents and to buy in a lean stock, discount these bills in some of the branches of banks in Dumfries, or other neighbouring towns. If the drovers meet with good and quick markets in England, they remit money to these banks from the sales of the cattle to retire their bills; but, which is frequently the case, when they meet with bad markets, or from whatever

whatever cause it happens, when remittances are not duly made, payment of these bills is demanded of the drawers, and they are obliged to repay to the banks the prices which they drew for their own cattle three months before. A small dividend from the funds of a bankrupt drover is all the reimbursement which they receive after much delay, expence, disappointment, and vexation, and sometimes total ruin to themselves and their families.

In this way the gentlemen and the farmers, and not the drovers, run the whole risk of the droving trade. By this mode of taking and discounting bills at 90 days, each farmer cautions the drover to the bank, to the amount of the value of the cattle he sells him, whether that be 100*l.* or 1000*l.* sterling; the whole risk, not only of the state of the markets and of the sickness or death of the cattle, but also of the skill, activity, and honesty of the drovers lies upon the farmers; and they have often felt the weight of it much, both to their own hurt and that of their landlords.

This is an evil which every friend of his country ought to exert himself to remove. To me there appears only one effectual cure for it; which is, that all the gentlemen and farmers should form a firm resolution to sell for *ready money only*. If the great landholders, who keep large stocks of cattle on their own grounds, would take the lead in this resolution, carry their tenants along with them, and advertise early in all the newspapers that circulate in this part of the country, that they are determined to adhere inviolably to that resolution in all time coming, this happy reformation would soon become universal.

By this mode much advantage would accrue to many individuals, and to the country at large, and no injury or even hurt would be done to any person.

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Perhaps some might say, that if bills are not given and discounted, it would be impossible for drovers to purchase cattle to the extent of 150,000l. sterling annually in these three counties, which they do now, and the banks would be hurt by the want of the discount business. It is never meant that bills should not be discounted, but only that the gentlemen and the farmers should not be cautioners for the drovers to the banks. The persons who drove to a considerable extent ought to have funds or friends of their own to be security for them; let them and their friends raise money from the banks, and with that ready money buy cattle from the farmers. If some, who would be drovers, have no such funds, or cannot find such friends, let them apply their skill and industry to some other line of business more suitable to their situation; there is no reason that the country farmers should furnish these for them, to the ruin of their own families. In this way cattle would, as is right, sell a little lower, as much at least as is equal to the present discount. But this would be no loss to the farmer, because he would get the use of his money three months sooner, or he would save the three months discount which, in the present mode, he pays to the banks; and it would compensate the drover for the three months interest he would pay for the ready money to buy the cattle. The banks would lose nothing, as the same sum of money would pass through their hands, and, as is usual, they would take care that it should not go out of their office without sufficient security. And both the farmer and drover would be profited by this mode; the former, in being totally freed from that discount of drovers bills which has ruined many industrious farmers; and the latter, in a way they don't think of, by hindering them from running those rash and speculating risks, which

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in time past have brought on the ruin of the greatest part of the drovers.

Too many of them, knowing that the country at large are their cautioners in the present mode, to few of whom they have any particular or strong attachment, run such extravagant risks, as they would never attempt if they knew, as in the proposed mode, that the whole risk lay upon their own funds, or those of their particular friends, to whom they lie under great obligations, and have a strong attachment. By being cautious in the droving trade, they would certainly and soon become rich.

As the prices of cattle would be a little lower, in process of time English farmers or English drovers would come at least the length of Dumfries, with hard guineas in their pockets, to buy cattle; at present they have no encouragement to do this, because the competition between them and the Scottish drovers, who buy on credit, is not *now* upon a fair footing: these can *offer* a higher price than those would *choose to pay*; and though it is scarce credible, unless it had been frequently realized in fact, there are many farmers who, for the offer of two per cent. of additional price, will sell on credit to a man whom no insurance office would for 20 per cent. underwrite for payment of the price at three months distance.

Reducing the price of cattle a little, would be a real advantage to the English farmer, and to the consumers of beef in every part of Britain; would be the first thing which would secure to the Scottish cattle that preference to the Irish, which, on many accounts, they deserve; and it would be no loss to the Dumfries and Galloway farmers. In the same proportion in which they would sell out their aged and well-conditioned cattle cheaper, they would buy in their younger and leaner cattle. Between buying and selling,

selling, they would have as much clear profit as they have at present. The difference between four pounds and six pounds is just as much as that between five pounds and seven pounds. On that part of their stock which they breed, there would be a small loss the first and second years; but this, compared with their whole stock, would be so small, that it would be fully compensated by the smaller sum of capital perpetually sunk on their ordinary stock of cattle, and consequently by the smaller sum of interest, which they would have either to pay (which too many do) or to sink on their stock. This plan of reducing the capital and taking away the risk, would be peculiarly seasonable in the present situation of the country.

This plan of selling for ready money only, should be extended also to the smaller cattle-dealers, commonly called *jobbers*, who buy younger cattle from the farmers, in small detached parcels, and drive them to the neighbouring Scottish markets, from one market to another, and many of them to Carlisle and other market-towns in the north of England.

4. The improvement of any country by agriculture, renders the climate much more mild and warm, and hinders the rivers from rising to so great a height as they did in its uncultivated state. Climate depends not solely on latitude and elevation, but also on the state of that surface of the terraqueous globe over which the air passes. Hence the temperature of all those countries which lie contiguous to any large body or branch of sea. Hence the intensity of cold in winter and of heat in summer of those countries which are surrounded by a large tract of dry land in an uncultivated state.

The more any country is pulverised and fermented by agricultural improvements, the greater quantity of warm effluvia

effluvia are perpetually rising from the ground, mixing with and tempering the air. Accordingly a cultivated country is much more temperate and warm, in fact, than an uncultivated moor of the same latitude, elevation, and distance from the sea. I have often observed the snow lying thick on a barren, uncultivated moor, on one side of a dyke or wall, and totally melted away in a rich and highly cultivated park on the other side of the dyke. This could proceed from no other cause but the greater quantity of warm effluvia perspiring through the open pores of the cultivated ground.

By the greater openness and porosity of the surface of cultivated land, and the greater quantity of vegetables which it produces, the greater portion of the rain that falls upon it is imbibed into the soil, and the springs which run in it are entangled by the vegetables upon its surface, and are exhausted by the nourishment of them, and, consequently, the smaller portion runs off upon the surface in a sudden flood to swell the rivers. Fact confirms this theory. In countries lately cultivated to a high degree it hath frequently been observed, that the rivers very seldom rise so high as they formerly did.

5. All the vegetables and animals in any country greatly resemble the nature of the soil in which they were reared. Upon a strong deep soil the grass, the corns, the trees, the brute creatures, and even the human species, are much larger and stronger than those which are reared on a thin light soil.

The diseases incident to all these correspond in their natures very much to the soils and climate in which they are reared, and vary with the variations of the states of the weather in different years. In a course of wet years one kind of disease in all these prevails, and in a course of hot dry years another.

Such are the observations which have occurred to me respecting the agricultural state of this interesting district. Much satisfaction shall I feel if they are found at all conducive to its future improvement. I have 'stated' my thoughts upon the subject with freedom, and, I trust, without prejudice; neither anxious to convert others to my opinions, nor too tenacious of my own, if, upon farther investigation, they should be found erroneous.

APPENDIX

A P P E N D I X.

No. I.

INTRODUCTION TO THE AGRICULTURAL ACCOUNT OF DUMFRIES-SHIRE, PROPOSED BY THE LATE ROBERT RIDDELL, ESQ. OF GLENRIDDELL, F. A. S. OF LONDON AND EDINBURGH, AND MEMBER OF THE LITERARY AND PHILOSOPHICAL SOCIETY OF MANCHESTER.

DUMFRIES-SHIRE (the most southerly county in Scotland) consists of the shire of Nithsdale, the stewartry of Annandale, and of five parishes, which, by an arrangement that took place in the year 1747, were detached from Roxburghshire, and added to it, namely, Eskdalemuir, Ewes, Westerkirk, Langholm, and Cannonby.

It contains the following royal burghs represented in parliament: Dumfries, Annan, Sanquhar, and Lochmaben; and the following burghs of barony, having fairs, &c. Monnichive, Thornhill, Moffat, Lockerby, Ecclefechan, and Langholm.

The population of this county in 1755, according to Dr. Webster's report, amounted to 39,788 souls, but now probably exceeds even 50,000.

The extent of this county has not yet been ascertained, no survey having been taken; though a subscription for a county map has been opened, and the surveyor, Mr. William Crawford, has begun the undertaking.

The Nith and the Annan are the principal rivers in the county. The secondary ones are, the Cairn and the Cluden, which join the Nith; and the Moffat, the *Ae*, and the Milk, which fall into the Annan. The Esk, which runs a short way through the bottom of the shire, becomes a considerable river before it falls into the Solway Firth. There are several lakes in Dumfries-shire; but none of any considerable magnitude. In the vicinity of Lochmaben are seven. In the head of Moffatdale two. In the upper part of Nithsdale four. And in Annandale and Eskdale there are also some small ones.

The climate varies much. Along the hilly part, on the confines of the shires of Ayr and Lanark, the atmosphere is cold and wet, particularly in the upper parts of Moffatdale. But it becomes warmer and drier as the country falls towards the vales of Nith and Annan, which, from Thornhill to Caerlaverock, and from Lochmaben to Graitney, possess a finer climate than any other district in the south-west of Scotland.

In such a diversity of climature, and such a variety of hill and dale, the soils may be expected to vary much. Upon the highest ranges of the hill country, they generally consist of bog or moss, and rock intermixed with a thin cold gravelly soil; though sometimes a mixture of good clay will appear. In other moors, blue clay of a poor chilling nature where the land is wet, or light sandy pebbly gravel where it is dry, generally occur. Lower down the country, the soils mend, becoming warmer, and the gravel more intermixed with clay and loam, often sandy, and interpersed with large rocks and stones. This soil agrees with lime, and, when properly cropped and laid down in grass, it affords a rich pasture for black cattle, and would answer well for sheep. The nearer to the vales of Nith and Annan, the soil becomes warmer and richer: though in Nithsdale it is in general of a lighter quality than in Annandale. The haugh or holm-lands on the rivers (which are extensive) are of a clay, a loam, or a sandy soil, and are kept much under tillage.

The highest parts of the county, towards Ayrshire, Clydesdale, and Tiviotdale, are all occupied in sheep-walks. The lower parts (which though upland, yet being of an arable nature, are, in general, laid down in grass, or remain in a state of nature) feed herds of the Galloway breed of cattle; and the vales of Nith and Annan produce excellent wheat, barley, peas, and oats.

The fuel made use of by the greatest number of the inhabitants, is peat or turf. Coals are sold at the two extremities of the shire: at Sanquhar in Nithsdale, and at Byerburn in Eskdale. Now that the duty is taken off, they will be brought from Cumberland, across the Solway Firth, to Dumfries, Annan, and the smaller ports in Annandale, in greater abundance than formerly.

About twenty years ago, lime began to be burned and sold at Closeburn; and since that period at Barjarg. This has greatly contributed to the extension of agriculture in Nithsdale. Lime is also sold at the works of Kellhead, of Cumlungan, and Brae's, in Annandale. But from its being found more frequently in the lower parts of the county, the farmers there often burn it with peat in turf kilns.

In the year 1776, the gentlemen of Annandale employed Mr. John Burrel to make a survey of that part of the county in search of coal. His journal will be found of considerable use in the enquiries now going forward, as it minutely describes the different soils in that part of the county.

The greatest improvement that Nithsdale wants, is a navigable canal from Sanquhar to Dumfries, to carry coals down the county. Could that great advantage be effected, this part of the kingdom would immediately become the first situation, for a great manufacture, of any, perhaps, in the island of Great Britain.

No. II.

ON LEASES IN SCOTLAND, AND THE COVENANTS IN THEM.

BY MR. ROBERT RAMSAY, WRITER IN DUMFRIES.

IN the course of managing some Gentlemen's estates in the neighbourhood of Dumfries, the following observations have occurred to me, which, if they can be of any use to landlords or tenants, I could wish were improved and made public.

A landlord, at letting his lands, ought to have the three following particulars chiefly in view :

1. A good tenant. 2. An adequate rent. 3. The proper management of his farm. Before he enters into a lease he ought to be well informed,

1. Of the general character of the person who proposes to become his tenant, and he ought not on any account to transact with persons of suspicious characters. 2. Of his knowledge of husbandry. 3. Of his industry and economy. 4. Of his abilities for taking and stocking the farm.

In order to form a just idea of the value of the farm two things are to be attended to, viz.

1. Whether it is in a state of nature ; or,
2. Whether it is improved.

If it is in a state of nature, the landlord ought to get it surveyed and planned in such a manner as to distinguish accurately the quantity,

1. Of arable land, and general properties of the soil, whether wet or dry, light or heavy, &c. 2. Of meadow ground. 3. Of such pasture ground as will not admit of further improvement. 4. Of moss. 5. Of wood land.

And these being known, and due regard had to the situation of the whole,—whether near to, or far from, a market-town or sea-port, it will be easy to fix a suitable rent, which may either be the same during the whole lease, or rise gradually, according to the proposed stages of improvement.

All these particulars being thus ascertained, the landlord ought, without delay,

1. To get all the marches properly straightened.
2. To inclose the whole with dikes (walls) or ditches, suitable to the nature and situation of the soil, as well as to the stock to be kept.
3. To point out the most proper subdivisions, and cause dikes of stone or earth, or ditches, to be built and made. And

4. To build a suitable set of farm-houses, as central as possible, consisting of
 1. A dwelling-house for eight or ten of family at least.
 2. A milk-house.
 3. A cellar.
 4. A byre (cow-house), and straw-yard with shades.
 5. A stable.
 6. A barn and barn-yard.
 7. A shade for husbandry utensils.

These buildings are all absolutely necessary ; but there are other conveniences besides which ought to be attended to :—such as, a hog-house and hog-yard, a house for poultry, a peat-house, a kiln, if the farm is not near a mill, a pump-well, if water cannot be got conveniently otherwise, a kitchen-garden, &c. ; to which may be added, the straighting of private roads, and shutting up all unnecessary ones.

In letting the farm, great care should be taken to lay down a proper plan of management.—For example :

1. The tenant should be bound not to plow any of the ground till it be properly manured by
 1. Lime, or,
 2. Shells.
 3. Marle.
 4. Sea-sleech.
 5. Dung.
 6. Water-tathing, or the like.
2. To begin at one side or end, and go regularly over the farm.
3. To take only a certain number of crops till the ground be laid down to grass.
4. Not to break it up for a certain number of years after being laid down.
5. To consume the fodder on the ground.
6. Not to have above a certain proportion at one time in tillage.

Besides these, the tenant ought to be farther bound,

1. To keep his houses, dikes, and drains, constantly in good condition, and to leave them so at the end of the lease.
2. To preserve natural woods and planting.
3. To cast peat-mosses, or marle-pits, &c. in a regular manner, and fill them up properly as he goes along.
4. Not sell or give away any peats, marle, &c.

And a conventional or stipulated penalty ought to be annexed to each omission or contravention, as it will seldom happen that the judge ordinary, or even arbiters, will give suitable damages *.

At delivering the lease, the landlord should be prepared to give the tenant a set of instructions for managing his farm properly, suited to lands both *in a state of nature*, and *improved* ; and to their being taken for grain or grazing ; and for sheep or black cattle ; as many tenants are incapable of laying down a proper plan for themselves, and so cannot thrive. The tenant ought to pay a certain rent in money, in

*. This is a matter of much importance, and ought to be particularly attended to.

(v)

full of all demands :—and as the landlord ought to advance the money for all improvements, the tenant should become bound to pay a certain rate of interest, or additional rent, as soon as the money is laid out.

Many landlords take their tenants bound to pay services, or baily-work,

1. Of casting, winning, and leading peats, perhaps one hundred or two hundred loads, three or four miles distant.
2. To bring lime, perhaps, twenty miles distant.
3. To bring coals as far.
4. To plow and harrow.
5. To lead dung.
6. To cut down and lead corn.
7. To cut, win, and lead hay.

And besides all these to pay casualties ; such as,

1. So many fowls in winter.
2. So many chickens in summer.
3. So much butter and cheese.
4. So many sheep and lambs ; and the like.

I humbly think these are all grievances upon a tenant, and the payment and performance of them are more hurtful to him, than of real advantage to the landlord ; besides, the services are seldom regularly performed, and the casualties are never of the best kinds. A tenant should have as little of his time unnecessarily taken up as possible.

Many landlords impose the payment of all public burdens ; such as,

1. Land-tax,
2. Stipend,
3. Schoolmaster's salary,
4. Kirk and manse-stents,

} upon their tenants ;

but as these are uncertain, and may sometimes be higher than the tenant, at taking his lease, imagined, he ought to be relieved of them, and pay only a certain money rent. It may even be doubted, whether he should pay the multures, which being a great drawback on improvements, should, if possible, be purchased by the landlord, or a tack of them obtained.

Suppose the money-rent of a small farm to be

L.	s.	d.
20	0	0

And suppose the tenant agrees to pay the whole public taxes, which are at the commencement of the lease

2	0	0
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22	0	0
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and suppose the land-tax rises from three to four shillings a pound ; the minister gets an augmentation of his stipend, one third ; the poor schoolmaster's salary is raised from one to two hundred merks ; and the kirk, manse, and school-house are repaired at an expence of two or three hundred pounds ; or rebuilt at treble the sum : in these events, the tenant's rent may be raised to upwards of twenty-five pounds, which is more than it can bear.

This is not all : some consideration is due to the very time lost in going to pay these expences ; and every hour unnecessarily spent by a tenant, is a loss to him, and ought to be prevented.

The next points to be confidered are, 1. Which is the most advantageous mode of letting lands, whether by private bargain or by public auction. Secondly, What is the proper length of a lease. Thirdly, What are the fittest terms of entry ; and, fourthly, What is the best time for paying the rents, whether in money or in kind. To which I shall add what has occurred to me respecting prohibitory clauses in the lease,

lease, against sub-letting, assigning, or being adjudged, and the tenants giving or not giving what are called fines, or, in Scotland, grassums.

With regard to the first ; I think, where lands are to be *sold*, there is the best chance of getting the highest price at an auction ; but where they are to be *let*, the getting a proper *tenant*, and getting the terms of the lease properly adjusted, for the reciprocal advantage of both parties, should be the first consideration, which must at once become a matter of uncertainty, if an auction is to be resorted to, where *every person* is at liberty to offer, whether he has knowledge, or ability, or character, whilst he should be possessed of all those qualifications. It may be said by the advocates for this mode of letting, that it gives the chance, by a competition, of getting the *highest rent* ; and as the landlord may, and no doubt *will*, make a stipulation for the tenant's finding satisfactory surety for his fulfilling his part of the lease, so he will have himself alone to blame, if he does not get any want of ability, at least, thus supplied. But even this does not appear sufficient to recommend the *scheme*. It must be admitted, that, by getting surety, the landlord will run no risk in regard to the payment of his rent, whilst the tenant, and the person joined with him, continue solvent ; but if the tenant should fail, it would be disagreeable to be obliged to distress his surety ; and if the tenant should turn out to be deficient in knowledge or character, no bondsmen, however good, could supply these defects. Indeed, in most cases, it will be only exceptionable tenants who will offer to take lands by this mode of letting, because, in general, the articles, which will be framed by, and calculated solely to gratify the humour of the landlord, will not, perhaps, be what a good skilful tenant would agree to, if a transaction were to be made in any other mode ; and it is to be dreaded this circumstance, which is far from being immaterial, will often prevent a competition.

In some cases, there is a sort of necessity for letting lands by auction ; for instance, where they are under the management of a judicial factor, or under the management of guardians, or tutors, or curators, but especially the former ; or belonging to a corporation ; that there may be no room for collusion or suspicion : but this exception, which seldom relates to a lease of any length, should not have any influence on the general rule.

The best mode seems to me to be this : The landlord, after digesting a set of articles suited to the nature of the different farms, which he should do after the most mature deliberation, should, in tillage farms about three years, and in farms fit only for pasture about one year, before the expiration of the present lease, apply to the present tenant, if he be one to his mind, to know whether he inclines to take a new lease ; and, if this be not likely to happen, he should, six months at least before the expiration of the lease, give advertisement that the farm is to be let at such a term, and mention the number of years and the quantity and quality of the farm ; and that the general regulations are fixed upon, and will be communicated ; and request those willing to become tenants, to come and treat with him between and a certain day. It is a practice with some landlords, in place of immediately entering into a treaty, to desire written proposals to be given ; but surely this cannot be so satisfactory for either party, as a personal interview and a full discussion. When written proposals are going on, many months may intervene between the date of the first and the landlord's final answer ; whereas, in consequence of a personal interview, their sentiments are at once made known to each other, and a transaction made or a final parting. It has sometimes occurred, that such an abuse has been made by landlords of written proposals, that one and

and the same person, by being told that more rent can be got, has been led to make a second and a third offer without any other person ever being upon the field; and all the while no precise rent has been mentioned by the landlord; a practice which has something improper for its object, and ought therefore to be laid aside.

Some persons from ignorance, some from a kind of necessity, and others from a malicious resentful disposition, will offer in this way more than the land deserves. No offer should be made till the landlord has asked a rent; and the rent to be offered by the tenant should not be mentioned, till every other article be fully adjusted and discussed. For instance;

First, The number of years.

Secondly, The term or terms of entry.

Thirdly, The liberties and privileges reserved to the landlord of planting barren-spots or belts; the cutting coppice woods, or planting and inclosing the young stoles; the searching for minerals, metals, &c. and taking them out; the making or straightening roads, and streighting marches; and the like.

Fourthly, The obligations to be performed by the landlord; such as, repairing or rebuilding, or making additions to, the principal dwelling-house, and cot-houses and mills; the repairing or rebuilding, or making additions to, the march or division-dykes of stone or earth, and the hedges, or ditches, or drains; repairing or making of new embankments, to prevent the overflowing of rivers; the allowing marle to be taken out of the pits or mosses in the farm about to be let, or a certain quantity yearly out of some other farm, or allowing a certain quantity of lime; the allowing a certain quantity of peats from some other moss, if none be in the farm about to be let; and the allowing timber for upholding the houses, to be cut at some person's sight, if any be growing upon the farm.

Fifthly, The exemption from thirlage, and from performance of services and payment of public burdens, if such had been formerly performed and paid by the tenant.

Sixthly, Power to the tenant to quit at the end of a certain period, on giving previous notice to the landlord a certain number of months prior to the proposed term of removal.

Seventhly, A freedom of sub-letting or assigning, or an exclusion of sub-tenants or assignees.

Eighthly, The plan of management of the farm; or the like.

With regard to the second head, *viz.* the length of leafes, this will depend upon a number of circumstances: Thus, 1st, Whether the farm is in a state of nature or improved. 2dly, If in a state of nature, Whether it is capable of much improvement. 3dly, What is the kind of improvement of which it is capable. 4thly, Whether the proprietor will give anything towards its being improved; or, Whether he will insist on the tenant's improving it, and being at the whole expence. 5thly, Whether it be wholly or mostly, or only in a small proportion, capable of tillage. 6thly, Whether it be already wholly or mostly improved; and, 7thly, Whether it be near to, or distant from, any considerable town or village, or extensive manufactory; or, Whether any such are in contemplation soon to take place near it: all which have great weight when lands are to be let.

Till within these few years, agriculture was little regarded in this part of the kingdom; and whilst that was unluckily the case, the length of leafes was no great object.

object either to landlord or tenant ; but now that cultivation is better understood, leases must be considered in a very different light. The great matter is to consider on the one hand, in case the tenant is to be at the expence of improving the land, what length of time will give him an opportunity of getting a suitable return from it, beyond what the land would yield in a state of nature ; and, on the other, the landlord, in an age when the value of land is fast and greatly increasing, may not, by too long a lease, deprive himself of getting the advantage of such increase.

The matter will be best determined by the landlord's being at the expence of the whole improvements, and then the length of the leases may be such, that if any great increase shall take place, it should not be long till he can have an opportunity of availing himself of it. In case the landlord will be at the expence of such improvements as the tenant shall judge proper, and that he himself shall approve of, there does not occur any solid reason for his putting it long out of his power to avail himself of a rise in case he can obtain it. If the tenant has time to go *twice* over the land in a proper rotation of tillage and pasturage, he cannot complain if the lease shall then terminate, for he has got a chance of re-imbursement by the second course in case the first was unproductive. It is believed that, in general, this may take place in the course of twelve or thirteen years.

On the other hand, in case the tenant becomes bound to improve the farm, or gets it in an unimproved state, and the landlord is not to be at any expence for improvement ; and the tenant is to be limited in his tillage, which should always be done, a lease of the endurance of eighteen, nineteen, or twenty years seems to be no longer than is necessary for the tenant's getting a suitable return for sinking his money and bestowing his labour upon the improvements : and even at the end of this period, it will very probably have the effect of stimulating him to make further improvements, if there be room, towards the end of the lease, provided it be agreed, that he shall get allowance from the landlord of such a proportion of the expence of the improvements, made in the course of the last three years, as two skilful honest men, to be mutually chosen, or appointed by the judge-ordinary, shall determine, in case the landlord and he cannot agree it themselves.

The improvements are of two kinds ; the one temporary, the other permanent. Under the former are comprehended, lime, marle, fleech, dung, and graft-seeds. Under the other, houses, walls or dykes, hedges, ditches, drains, and roads of communication ; and perhaps belts and clumps of planting.

In general, it will suit tenants better to pay an advanced rent, equal to five, six, seven, or seven and a half *per cent.* of interest on the expence of the former, than sink his money upon them. The expence of the other should, in all cases, be defrayed by the landlord ; his approbation and consent, however, being obtained, at least asked and tried to be obtained, before the improvements be made.

In wild uncultivable lands, where inclosing and subdividing or draining are the only improvements, and where this is to be done at the expence of the landlord, it does not occur that a long lease need be any great object to either landlord or tenant. In the course of twelve or thirteen years, it is probable, if there be extremes of good and bad seasons to affect the stock, or great rises or falls to affect their prices, the one, as well as the other will take place in this period. If the landlord will not be at this expence, and that it is done by the tenant in such a manner as will evidently redound to the future benefit of the farm, then an addition ought to be made to the length of the lease of

of at least seven years, that the tenant be induced to make, and may have an opportunity of reaping a reasonable benefit for making these improvements.

In leases let by factors on bankrupt estates, the length is generally three years, upon an idea, that as the lands are in view of being to be soon sold, a lease of any great length would prove hurtful to the sale. It is highly probable it would: but then this should be kept in view, that so very short a lease, either prevents the rent from being raised, and any substantial improvement being made; or, what is still worse, it will often have the effect to make the rent fall; and the lands, if fit for tillage, be greatly run out. To guard against these evils, the factor, with the approbation of the creditors and by authority of the court, should be empowered to grant a lease for a longer period; for instance, twelve or thirteen years, with a condition, that if in that time the lands be sold, or the sequestration shall cease, the lease shall be terminable at the expiration of the first three years; or, upon six months previous notice, at the expiration of any after-year the proprietor shall incline, provided he agrees to pay the tenant the expence, or a proportion of the expence, of what rational improvements he shall have made, in the view of continuing the whole length of the lease, and from which, at his removal, he shall not have got a reasonable return, in the opinion of skilful neutral persons. This will have the effect to raise, or at least not to decrease, the rent, and make the tenant keep the farm in good order, and perhaps make material improvements: and thus a considerable advance may be got in the price when a sale takes place.

In letting lands by guardians, or tutors, or curators, much the same scheme may be adopted; which, in all probability, will be better for the proprietor, than limiting them to his coming of age, or perhaps to a more early period.

In granting leases to *old* people, it is thought it might answer a good purpose, and tend to some improvements, to make them for life, and as many years thereafter as, by the common computation of the chances of their lives at the time, will make them equal to other leases: the hope that life will be prolonged beyond the common computation, will most probably have the effect, of not only preventing the tenants from running out the land, but inducing them to make still some further improvements upon it.

With regard to the term or terms of entry most advantageous for the tenant; I think, in farms fit only for *pasturage*, Whitsunday (11th of May) is the best term; but where the farms are solely or chiefly in tillage, I think the tenants should be allowed to enter to the arable land at the separation of the former tenant's crop from the lands, and to the houses and pasture land, and land and meadow to be cut for hay, at the following Whitsunday. In both cases, the first half-year's rent should be payable at the ensuing Martinmas, and the next at the following Whitsunday; and if not paid at these terms, to bear interest afterwards till payment. There may sometimes be a little inconvenience to the tenant, to be at a distance from his plowing and harrowing during the winter and spring; but this is only for one season; and it will be amply made up by the advantages which he will afterwards derive from it.

In some leases, *Candlemas* (2d February) is the term of entry to the *arable* lands: but I think Martinmas, or the time of the former crop's being separated from the land, is preferable. A great deal may be done by the new tenant between the separation of the former crop from the land, and the term of *Candlemas*, preparing for a crop, whilst

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the use of the land, which the new tenant may plow in that time, would be of very little advantage to the former tenant.

There is a custom which has long prevailed in this part of the country, where the term of entry is *Whitsunday*, for the tenant not to enter to the *barn* till fifteen months after, on the idea, that he will not have any crop produced by the farm, to put into the barn, until Lammas come a year after his entry to the farm, and will have occasion to use it for his crop, for fifteen months after his removal from the farm.

This, I think, should undergo some alteration, even upon the supposition that Whitsunday should continue to be the term of entry. The new tenant must, soon after his entry, have some corn for the use of his horses, and against winter, must have a sufficient quantity both of corn and straw for his black cattle as well as his horses. Now where is he to put up and thresh out this crop, if he has no privilege in the barn? The total want of it must occasion a very great inconveniency. Perhaps it would be better to let the new tenant have immediately the right to the barn, and let the old tenant put up his outgoing crop in the barn-yard, and take it afterwards away as he comes to have occasion for it; only it may be understood, that if he has occasion to thresh any part of it before he removes it, he shall have access to the barn for this purpose; in which view, it would remove all suspicions between the old and new tenants, if there was a small part of one of the ends of the barn, separated from the rest by a partition-wall, and the old tenant to have the use of this apartment for threshing and putting-up his threshed corn.

I think it would be a good regulation in letting leases, to take the tenant bound to sell to the landlord, and he to sell to his incoming tenant, a certain proportion, if not the whole, of his crop, at a price to be fixed by two or more neutral persons, to be mutually chosen by them, or appointed by the judge-ordinary.

The incoming tenant's thus getting a crop ready for him on the farm, must be a great convenience; and it is equally obvious, that it must be much in favour of the farm, to have the crop kept and consumed upon it: and it will be ensuring the landlord of a good part, if not the whole, of a year's rent, for which he is often obliged to have recourse to expensive legal measures, which cannot fail to be hurtful to the credit and interest of his old tenant.

In regard to the common clause thrown into leases, excluding assignees and subtenants; I readily allow that the choice of a tenant should be the landlord's first object; and under this impression, the exclusion of assignees and subtenants, excepting with his consent, is a natural and necessary consequence. But as the landlord cannot insure the life of his tenant a single year, or even a day, and that his heir may be in every respect disagreeable to him, the absolute exclusion of assignees and subtenants cannot now serve any rational good purpose to him, whilst it may be productive of bad, nay the worst of, consequences to the tenant and his family, and even prejudicial to the landlord himself.

The idea of the seclusion must have taken place at a very distant period, when agriculture was little attended to; and the chief reason of introducing it, most probably, was this: That when the great chieftains were at war with one another, which was frequently the case, they would be jealous of those of another clan, having a right to set themselves down amongst them, perhaps as a spy, and thus would anxiously exclude them from coming into the estate: but now that agriculture stands upon a very different footing, and that it must be a great inducement for tenants to make improvements on.

on their farms, when they know that they can sublet or assign them at pleasure, and that the feuds which unhappily subsisted long amongst the great landlords are at an end, this seclusion should be entirely abolished, or at least confined to persons of known bad fame. Whilst it is continued, the derangement of the affairs, or the death, of a tenant, must often sink to him, and his heirs and creditors, what had cost him much labour and expence ; for, in the one case, the creditors cannot dispose of the lease, and the tenant has no fund to enable him to keep and manage the farm ; and, in the other, perhaps he leaves a widow and a young child, and no other fund, after his debts are paid ; and, of course, in this situation, they cannot manage it to any advantage. Whereas, were leases allowed to be bought and sold, tenants would exert themselves in improving the farms, and creditors would have greater security for that with which they trust the tenant, and in the end, draw very differently from what they must often do ; and a young fatherless family would often be left in tolerably easy circumstances ; whilst, by not being able to manage or dispose of the farm to advantage, they are in effect left in a state of beggary. Besides, it would often be a delirable circumstance for the tenant, in his own life-time, after he has highly improved his farm, to dispose of it ; or, at his death, order it to be disposed of, for the benefit of his family at large, or leave it to some one of them, not his heir at law, and burden him with what may be reasonable in favour of the rest of his family. In a word, it does not occur how the landlord can be hurt by laying aside this seclusion ; and as, in every point of view, it will materially serve the tenant, it should never more be heard of, excepting in houses let in towns, which are generally let from year to year, and no expence laid out by, or much advantage accruing to, the tenant ; and where it sometimes might be highly improper for a landlord, to have a person brought to his very door, who, perhaps, may be personally disagreeable to him ; or by following a different line of life, or having a different kind of family from the original tenant, might greatly injure the house.

There is another circumstance I wished to have taken notice of ; I mean, landlords taking fines or *graftums* from tenants ; but I have not yet digested the matter so fully, as to be able to give any clear opinion about it, farther than this : That if *it* shall have the effect, to reduce the tenant's capital below 100*l.* for every 20*l.* of rent, he had better give almost 12*l.* of additional rent than give the *graftum* upon a lease of thirteen or fourteen years endurance : and whilst the seclusion of assignees and subtenants is continued, it is taking a sum of money from him, for which he can get no return, should it happen, that he or his heir becomes unfit to continue the lease, which may be the case, perhaps, the very next year after their entry.

Before I conclude, I would recommend to both landlords and tenants, as soon as they have made a bargain, to get it properly digested into a formal lease, and not to trust to a verbal agreement, or a confused scrawl in the form of a letter, or minute ; which seldom fail to occasion law-suits, which ought, as much as possible, to be guarded against.

The ordinary clauses are these, *viz.*

1. The granting to the tenant and his heirs, or subtenants or assignees, if this be agreed to, a lease of the particular farm, with such privileges as belong to it ; such as getting peats, or marle, or lime, or shells, in certain quantities, out of a different farm ; a right of common ; to a fishing ; or the like.

2. A specification of the number of years during which the lease is to continue, from and after a certain term for the whole farm ; or one term as to one part, and another as to the remainder.

3. A freedom to the tenant to quit after a certain period or periods, upon giving so many months previous notice prior to the first term of entry ; and not having injured the farm by improper management, or by a scheme different from the limitations of the leases. But no such freedom to the landlord.

4. The obligations upon the landlord to build, or put into a tenable state of reparation, the houses necessary for the farm ; or to allow the tenant to get it done ; or allow a certain sum not exceeding so much for getting them properly done, upon the tenant's producing vouchers of the money being wrought for : where new houses are to be wholly built at the expence of the landlord, or only a part of the expence to be defrayed by him for certain of the materials, the number, and dimensions, and quality should be very particularly mentioned.

5. The obligation upon the landlord, between and a certain time, to build or repair march and division dykes : and to make new dykes, hedges, ditches, drains, and embankments, and particular materials and particular dimensions, and in particular directions ; or to allow this to be done by the tenant ; or to allow him a certain sum for the whole, on producing vouchers of the work being sufficiently executed.

6. The obligation upon the landlord, between and a certain time, to get all commons divided and allocated ; or runrigg lands, or common fields, exchanged and settled ; or the limits of fishings ascertained ; and do whatever else shall be agreed to be done by him.

7. A declaration that, if he shall not, without unnecessary delay, fulfil these obligations, the tenant shall, after requisition, be at liberty to get them done, and retain the expence out of the first year's rent ; though this shall not, if the expence exceeds his rent, free the landlord from damages for the delay.

8. A clause of warrandice, and an obligation to pay and free the tenant of all tiend or tithes (including the stipend), and of the school-master's salary, land-tax, and expence of building and repairing kirks, manses, and school-houses, and all other public and parochial burdens imposed, and that may and shall be imposed, excepting the statute-labour at the high-roads, or its conversion in money : all which public burdens should always be paid by the landlord.

9. Exceptions and reservations by the landlord of particular spots of land for feuing or for erecting machinery or the like, wherever the same may be necessary.

10. Liberties and privileges to the landlord and others, even strangers if he pleases, of access to peat-mosses, marl-pits, lime-stone or free-stone quarries, and the like ; and to himself and his heirs to plant trees in small clumps or belts, or otherwise on barren ground ; and to inclose such plantations, and get the land so inclosed kept free from the pasture of cattle, for such space as he shall think proper ; he giving a reasonable deduction to the tenant for what land, not expressly reserved out of the lease, shall be thereby taken up from the use of the tenant. And moreover, the liberty of cutting, or allowing others to cut, and carry away coppice-woods and planting ; and inclose such woods and planting ; and restrain the tenant from pasturing within the limits thereof, for such space as he shall think proper. And to make trials for mines, minerals, and fossils ; and, if found, to work, or allow others to work them. He being in all such cases to give the tenant a reasonable deduction for the want of land.

land and pasture, and for what damages shall be done to the surface of the land, or otherwise ; according to the determination of neutral persons of judgment, to be mutually named by them, or appointed by the judge-ordinary, in case they cannot agree the matters themselves.

11. The obligation upon the tenant to pay the rent in money or in kind at the terms agreed upon, with interest till payment ; and a suitable penalty in default of regular punctual payment : the rent is generally the same sum throughout the whole lease ; but sometimes, and especially in unimproved lands, it rises after certain periods.

12. An obligation to pay an additional rent, by way of interest, at a certain rate, for what money the landlord shall agree to lay out for houses, dykes, hedges, ditches, or drains ; or for lime, marle, or the like, for the improvement of the farm. The first term's payment of the additional rent to commence at the first conventional term after the money, to any given amount, shall have been expended.

13. An obligation for delivery (if still insisted upon, but which should be abolished), of fowls, butter, cheese, peats, and coals, or the like, at or between and certain seasons or periods ; and, in case of non-delivery, an obligation to pay, in the option of the landlord, certain conversions, along with the next term's rent.

14. An obligation (if still insisted upon, but which ought also to be abolished) to perform certain services ; such as dung-leading, plowing and harrowing, hay and corn cutting and leading and putting up in stacks, casting and leading home peats, leading home from certain places coals and lime, and the like ; and, in default of performance, to pay certain conversions, in the option of the landlord, along with the next term's rent.

15. A declaration, that if the tenant shall at any time allow two years rent to be unpaid, the lease shall, in the option of the landlord, become void and null as to the remaining years thereof that may be then to run ; and the tenant be liable to be summarily removed from the farm ; but upon this condition, that if the removal takes place, either in consequence thereof, or in default of his finding caution even for a smaller arrear, and that the tenant has recently laid out any considerable sum, in proportion to the extent of the rent, upon building houses or dykes, or making hedges, or ditches, or drains, or laying on lime, marle, dung, or other manure, or the like, for improvement of the farm, and has not got a return for such expence, the landlord shall be obliged to pay or allow him such a sum therefor as neutral persons named by them, or appointed by the judge-ordinary, shall determine *.

16. If there be a miln, to which the farm is astricken or bound, there must be an obligation on the tenant to that effect ; but as multures are hurtful to the improvement of lands, they should be in a great measure abolished.

* This clause seems reasonable. The rent should be punctually paid, at least regularly paid half-yearly or yearly, as shall be agreed upon, after a little indulgence, which is generally given ; and if regularity cannot be obtained, the landlord should be at liberty to get free of a tenant from whom he cannot get his rent : but, on the other hand, if a landlord be averse, or perhaps cannot conveniently afford, to lay out money to make improvements, and that the tenant lays it out himself, and meets with disappointments in getting in money for paying his rent, it would be unreasonable that he should, on that account, lose the farm, and the expected benefit of these improvements, and the money laid out in making them ; and in that view the present clause has been suggested.

17. An obligation by the tenant as to the management of the farm. This will be different in different parts of the country, and the state of the lands, whether they are already improved, or in a state of nature.

This will be the substance :

1. Not to have in tillage, at one time, more than a certain proportion, or a definite quantity of the arable land.
2. Not to have any land under a grain crop, till it be sufficiently manured by so much lime, or the like.
3. After being brought into tillage, not to take above a certain number of grain crops following one another, until it be laid out for grass, and with the last of these crops to sow certain quantities of grass-seeds.
4. After being thus laid out, it must not be again brought into tillage till after a certain period.
5. The tillage ought to be begun at one end or side of the farm, and proceed regularly over it ; only meadow-ground not to be ploughed without permission.
6. It may be considered and mentioned, whether the tenant may take a greater number of crops after manuring and bringing into tillage strong old land, formerly uncultivated, than what he should take in the after-rotation, when the land is improved ; and, if agreed to, a clause should be inserted accordingly.
7. If a penalty for breaking through these conditions, or an additional rent by way of damages, be agreed upon, it will fall to be inserted here. In farms properly subdivided, and fit for tillage, there ought to be a plan made out at the time the farm is set, shewing the rotation of cropping each year of the lease.
18. The tenants are sometimes taken bound not to sell any straw, but consume it upon the farm, for the sake of producing dung. If this be agreed to, a clause may be inserted accordingly.
19. The tenant should be taken bound not to sell, unless specially permitted ; or give away, or allow more than a certain number of cottagers to get, peats or turf ; and the moss to be cut in a regular breast, and smoothed and covered up as the peats shall be thrown out.
20. If there be marle in the farm, and the tenant be permitted to take it out for the improvement of the farm, it should be done in a regular manner, to prevent waste ; and the tenant taken bound accordingly.
21. In some farms, sheep and goats are not allowed to be kept, ~~for~~ the sheep should do injury to the young hedges, and the goats do injury to the ~~young~~ rods. A penalty of so much for each head, each night, besides the real damages, may be added, with a view to enforce and insure the prohibition.
22. In the last year of the lease, the tenant should become bound not to have a greater quantity of the land bearing a grain crop than he shall have had at an average in former years ; and this to be as much together as possible ; and the crop on all the surplus land to be forfeited.
23. In the same year, he should become bound not to allow his horses, black cattle, and sheep, to pasture upon land bearing grass for hay, or natural meadow-ground, after a certain period ; the former after the middle of April, and the other after the middle of May.

24. In the same year, the tenant ought not, after the middle of March, to have any greater number of horses, black cattle, or sheep, on the farm, than he shall have had at an average in former years. Some tenants, from mere covetousness, have, for weeks and months, had the stocks of other farms, upon the one they are about to leave, to have these, and render the grafts of the other useless to the incoming tenant for the whole of the ensuing season; which should not be permitted, and a penalty should be added of so much per head of supernumeraries each night.

25. It should be declared, that if there be any dung on the farm at the end of the lease, it shall remain thereon, and go to the succeeding tenant without any consideration therefor to the former tenant, or the same to be paid for, as shall be agreed upon.

26. The tenant should become bound to keep, and at his removal to leave, the houses, including shades, and pump, and draw-wells, if any, and walls or dykes, hedges, ditches, drains, liggats, private roads of communication, and embankments, so far as injurable by his horses or black cattle, in tenable condition, and not pull down houses of any kind, even although constructed at his own expence, or take away doors, windows, or partitions, or lofts, although put in by him, without the landlord's knowledge or permission; but it should be understood, if the tenant has, for his own accommodation, and at his own expence, built any supernumerary houses or shades, the landlord ought either to pay him the value of them, according to the determination of neutral persons, or allow the tenant to remove the materials.

27. In case it be agreed that the landlord shall take the tenant's outgoing crop, or a certain proportion of it; or the whole, or any part, of his sheep-stock; a clause will fail to be added to that effect; and the mode of fixing the price, and time of payment, must be particularly mentioned.

These are the most general clauses. If any others become necessary from particular circumstances, they can be added in their proper place.

No. III.

LETTER FROM SIR JAMES KIRKPATRICK, BART. TO SIR JOHN SINCLAIR, RESPECTING THE LIME HUSBANDRY OF DUMFRIES- SHIRE, &c.

SIR,

A MAN who devotes so much of his time to the service of the public as you do, deserves the countenance of all men, and will certainly receive encouragement and aid, from every person who wishes well to his country.

In.

In regard to the particular point you mention ; the lime-quarry of Barjarg, in the parish of Keir, and county of Dumfries, the property of the Rev. Dr. Hunter, was discovered in the year 1785, and the first lime was sold from it in summer 1786, when the sale amounted to 12,640 Dumfries measures, shells. In the year 1787 the sale amounted to 27,263; measures ; in 1788, to 26,352 ; in 1789, to 25,729 ; in 1790, to 27,324 ; in 1791, to 27,722 ; and in the year 1792, to 22,260 measures. The Dumfries measure contains two heaped Dumfries pecks, or forty-three and one half Scots pints, and is sold at nine-pence.

The demand is chiefly from the parishes of Dunscore, Glencairn, Tynron, Penpont, and Keir ; in small quantities also from Closeburn, Morton, Durrasdeer, Kirkmahoe, and Irongray ; and, within these two or three last seasons, a good deal has been carried into the parishes of Kells, Dalry, and Balmaclellan, in Galloway, to the distance of more than twenty miles ; and the demand from that quarter is continuing to increase yearly.

The quantity allowed to an acre, is from forty to eighty measures, and those who have applied the smallest quantity, have generally succeeded best ; though with regard to this point, no certain rule can be given. More or less must be applied, according as the soil and situation vary ; and experience alone can teach a farmer what will answer best.

It is sometimes laid upon the sward, and that either with a view to improve the pasture, which it does to a great degree, or with a view to the ground's being broken up for a crop, which has been found to answer pretty well. But in this case, the land ought never to be plowed, till the lime has lain a season or two ; for if the land is plowed too soon after the lime is spread, much of it tumbles into the bottom of the furrow, from whence it may be difficult to recover it : and thus a good part of it is often lost. But the most approved way of applying it, (first taking care to flake it well) is to spread it after the ground is pretty well broken, when preparing for a potatoe or barley crop, or under fallow. In this way, it mixes immediately and intimately with the soil, and has never been known to fail of producing a full effect.

In your Twenty-ninth Quere you ask, If there are any practices in agriculture peculiar to this county, which would be of service to others ? Perhaps there is one. We excel, I think, most of our neighbours, in our method of cultivating that most useful of all roots, the potatoe. I shall, therefore, take the liberty to give you some account of it.

As soon after harvest is over as possible, the piece of ground, commonly poor stubble, intended for potatoes, is ploughed. It is allowed to lie in that state all winter, and in spring it is harrowed well, and soon after ploughed again : and this ought to be across. Then is the time, if the land has not been limed formerly, for laying on your lime, spreading it with care equally over the surface. When the season of planting approaches, the field must again be well harrowed, and then it is ploughed up into ridges of three and a half, four, or four and a half feet, according to the fancy of the farmer, though I should rather have them over than under four : along the bottom of the furrow, a proper quantity of well-rotted dung is spread, and upon the top of this the potatoe sets are laid, at the distance of six or seven inches from each other ; and with a single bout of the plough the whole is covered lightly up. In this situation they are commonly allowed to lie for perhaps two or three weeks ; and at any convenient time before the potatoes begin to rise, the ridges are completely ploughed

ploughed up. In performing this operation, a good ploughman will endeavour to raise the ridges to a higher crown, by throwing some additional mould upon the top of the covering furrow. In this situation they remain till you observe the young plants here and there making their appearance, when the whole field must be harrowed, not across, for in this way many of the plants would be displaced, but in the direction of the furrows, giving it more or less, as seems requisite. After this, when the plants are about four or five inches high, a furrow or two, according to the width of the interval, is taken from each side of the row, going as near as you can not to injure the roots of the plants: and for this operation the Scotch plough is to be preferred. After a few weeks, this furrow must be turned back, and then care must be taken to lay the earth as close, and to raise it as high, upon the necks of the plants as possible; and on the proper execution of this part of the work much depends: and some time after this, and last of all, when perhaps a new crop of weeds is rising, the part that remained unstirred is ploughed up, laying it equally to both sides. Perhaps, after all that has been done, a few weeds may grow among the plants, where the plough would not reach, which must be pulled by hand before they feed.

For all the spring operations, a time ought to be chosen when the ground is dry; and when it abounds in quicks, or the soil is stiff and hard to reduce, perhaps another ploughing and harrowing may be necessary. And due attention ought to be paid to the timeing of the different operations, that by each of them a fresh crop of weeds may be destroyed.

That the ground be limed is a most essential point, as it improves the quality and increases the quantity of the crop; and, which is of the greatest consequence, prevents the rot. Before the introduction of lime, I have known more than one third of the crop left in the field, on account of the roots being infected with this disease: but never do I remember to have seen a rotten potatoe in land that had been limed.

Such is the method practised in this neighbourhood, and experience has fully evinced, that it is a good one; as no where, I am apt to believe, are more plentiful crops of potatoes raised than in this county. It may seem tedious in description, but it is simple and easy in the execution: and no man who gives it a fair trial will, I am persuaded, have occasion to grudge his labour. Two hundred pecks, weighing fully six stones and a half each, to an acre, is looked upon as a very ordinary crop. I have had myself, more than once, upwards of three hundred and thirty, which at one shilling per peck (a medium price) produces 1*l.* 10*s.* per acre. What crop will pay better: especially if it be considered, that the land is left in the highest heart, fit to carry barley, wheat, or what you please to put upon it. In this way large fields of them are raised; and from farms adjoining to the sea-coast, large quantities are shipped off to Whitehaven, Liverpool, and some go as far as Bristol, where, I am told, the people prefer them to those of their own growth.

I shall leave your other queries to be answered by abler hands; but cannot help taking this opportunity of mentioning a thing of the utmost consequence to the country, *viz.* a regulation of our weights and measures. The necessity of reducing them to one standard becomes every day more evident and pressing. I therefore take the liberty of subjoining a copy of a letter from an acquaintance of mine upon that subject, which meets my ideas pretty nearly. For though I have turned my thoughts sometimes that way, I must confess I could never discover much difficulty

in the matter. It is an object, I am sure, well worthy the attention of the Board of Agriculture. The amazing, and almost incredible, variety of weights and measures at present in use, is a source of infinite confusion and inconvenience to dealers of every kind, farmers as well as others, and opens a door to boundless fraud and imposition.

I am happy in adding a stone to the cairn which has arisen around you while yet alive, and which will continue to increase, whilst memory holds her seat in the breasts of your grateful countrymen.

I have the honour to be, with high esteem,

SIR,

Your most obedient servant,

Clofburn.

JAMES KIRKPATRICK.

EXTRACT OF A LETTER ON THE SUBJECT OF WEIGHTS AND MEASURES.

I HAVE often, when talking of the necessity of reducing the almost numberless weights and measures in use over the kingdom to one standard, heard it represented as a matter of infinite difficulty and investigation, involved in intricacy, and as having baffled all the wisdom of all the lords and commons in parliament assembled more than once.

To me it appears perfectly simple and easy. If to reduce the different weights and measures to one standard, which is an object of the greatest importance to the nation, be the object of the Legislature, I can conceive nothing more easy to be accomplished. Let parliament fix upon one weight and one measure, no matter what (only let them be clearly defined), and all is done that is necessary to be done. There is no need for appointing a committee of the house of commons to examine and compare all the variety of weights and measures from all the different corners of the kingdom with one another, in order to their adjustment ; I say, there is no occasion for all this ceremony —let parliament only fix a standard, and there is not a farmer who sells grain, a tapster who sells a pint of ale, or a shopkeeper who sells a yard of ribband or an ounce of tobacco, but who will soon know how to proportion his price to the quantity sold.

For instance : Let the Winchester bushel, which contains $2150\frac{4}{7}\frac{2}{7}$ cubic inches, be the standard for grain (only I would throw away the fraction, and declare, that it shall contain exactly 2150 cubic inches) ; and, to please the Scots, let their pint jug or stoup be declared to be the standard for liquids of every kind and denomination, whisky, &c. ; and, which will please them still more, let it be larger, and instead of $103\frac{1}{4}$ cubical inches, which it contains at present, let it be made to contain $107\frac{1}{2}$, being an exact twentieth of the Winchester bushel ; and thus we shall have one standard for both dry and liquid measure throughout the kingdom.

Let any one species of weight—no matter which—the avoirdupois pound, its parts and multiples, be fixed upon, and declared the standard for every purpose whatever, without distinction, in which weights are required.

In like manner, let the English yard, containing three feet, of twelve inches each, its parts and multiples, be declared the standard for measuring lines, surfaces, and solids.

Let numbers also be defined : for at present, when one talks of a hundred it does not always mean five times twenty—a hundred weight means one hundred and twelve pounds

pounds—if one bargains for so many hundred girths, or nails, or herrings, by *bundred* is understood six scores, or one hundred and twenty—again, in selling sheep, in many parts of Scotland, by a *score* is meant twenty-one. Let all such distinctions and peculiarities be done away, and let words have their plain and natural meaning.

I have, for examples, given the above-named weights and measures, as best known to the country in general: and for the same reason perhaps, though it is not exceedingly material, parliament would do well to adopt them. The Winchester bushel is well known in many parts of Scotland, and pretty much used there; the Scots pint is often talked of in England, and when declared to contain just the twentieth part of a Winchester bushel will be perfectly understood; the other weights and measures mentioned are familiar to every dealer.

Thus every difficulty vanishes, and perplexity is at an end, or will soon be so: for I aver, that let parliament fix upon a weight and a measure, there is not an old wife in Great Britain, who has occasion to buy or to sell, who will not, in eight days, know how to accommodate her price to the new standards.

No. IV.

A REPORT OF THE STATE OF THAT PART OF THE COUNTY OF DUMFRIES KNOWN UNDER THE NAME OF ANNANDALE.

BY WILLIAM STEWART, ESQ., OF HILLSIDE, BY CARLISLE.

THE county of Dumfries is divided by nature into three districts, as it was formerly into separate legal judicatures. 1. The old sheriffdom of Nithsdale. 2. The stewartry of Annandale. 3. The regality of Eskdale.

Annandale lies partly in the 54th, and partly in the 55th degree of north latitude, and three degrees west of London. It is nearly the figure of an angle, having one side, to the south, bounded by the Solway Firth; another, to the west, bounded by Nithsdale and a small part of Clydesdale; and the other, to the north east, bounded by the shires of Tweedale and Selkirk, and by Eskdale and Cumberland.

The river Annan takes its rise in the northern extremity, and runs south about twenty-five miles; then south-east four miles, and again south seven miles, where it falls into the Solway, leaving about one-third of the country on the west, and two-thirds

on

on the east side. Each side is divided by different lesser waters, which fall into the Annan from north-west and north-east, and the south-east extremity is further divided by the water * Kirtle, which runs from north to south, making also a turn to the south-east, and falling into the Solway.

From the name of this district of country, it would seem it ought to contain the whole grounds within the water-fall or water-run of the river Annan, and of all the waters that run into it. It does not appear there is yet much deviation from this natural boundary. At present it differs from it only by a small encroachment of the county of Clydesdale upon the source of the water Evan, which runs into Annan from the north-west, and a similar encroachment of Nithsdale upon the water Ae, which falls into Annan in the same direction. Annandale seems in return to have acquired that part of the east-side of Nithsdale which lies at the southern extremity of it, consisting of part of the parish of Lochmaben; and nearly the whole of the parish of Mouswald. It has also in this view acquired the water-run of Kirtle, and of the west side of the water Sark, which divides Annandale from Cumberland.

The soil, climate, and produce of the country vary so much, that to give a just idea of them it is thought necessary to divide it into four parts. And this it is thought may most intelligibly be done by classing the parishes according to their uniformity in climate and produce.

Of old, Annandale consisted of thirty-two parishes, which by annexations that took place mostly between the Reformation and the Revolution, were reduced to twenty parishes or ministries. By the arrangement proposed,

1st Class, being the parishes that lie to the Solway Firth, and beginning on the south-east, are,

Graitney, including Redkirk.

Dornock.

Annan.

Cummertrees, including Trailltrow.

Ruthwell.

2d Class, which adjoin the above, and lie immediately north of them:

Kirkpatrick Fleeming, including Kirkconnel; likewise Half Mortony, now annexed to Langholm in Eskdale.

Middlebie, including Carruthers and Pennerhaugh.

Hoddam, including Luce and Ecclefechan.

Dalton.

Mouswald.

3d Class, lying immediately north of Class Second:

Tundergarth.

St. Mungo.

Dryfesdale.

Applegarth, including Sibbaldbie and Dinwoodie.

Lochmaben.

* Water is a term used in Scotland for a stream between the size of a large river and a burn or rivulet. It is commonly used for small rivers which fall into large rivers.

the Class, lying north of Class Third, and the uppermost in Annandale.
Hutton, including Corrie.

Wamphray.

Johnstone.

Kirkpatrick juxta, including Drumgreen.

Moffat.

The first division or class of parishes lies on the side of the Solway Firth, and extends but four or five miles from it. For a mile or two from the Firth, the soil is for the most part a light gravel, but in particular places there are tracts of some hundred acres of good loam, with some mixture of clay. The northern part of this class is chiefly of a different and very inferior quality. The soil is partly mossy; but chiefly a cold clay or till. A great part of it has been common, and some of it still in that state.

The second class lies from five to ten miles from the sea, and has very different qualities of land interspersed over them. Those parishes to the eastward have a great proportion of a mossy and clay soil; but the clay is generally of a fertile nature. The parishes to the westward have a greater proportion of a dry or gravel soil.

The third class lies from ten to eighteen miles from the sea. The soil is commonly dry, and a great part of it a rock gravel.

The fourth class lies from eighteen to thirty-two miles from the sea. It is mostly a mountainous country. The valleys are chiefly a sand and rock gravel, excepting to the eastward in Hutton and Corrie, where there is a considerable extent of good clay soil.

A more favourable exposure than Annandale for a country on the west of Britain, open to the moisture and rains of the Atlantic, could not be found. The country in general faces the meridian sun, and the vapours and cold rains of the German ocean seldom approach it. The mountains to the north and east enshrine the chilling blasts which come from these points. The climate or air of Annandale is mild and moist: but no injury is found from the damp to the health of man or animals; and in the upper and dry parts of the country, it is wholly found necessary for the purposes of vegetation. Snow does not lie long in any part of the country, and within fifteen miles of the sea it is seldom seen to remain for a week. A loss not unfrequent arises to winter grain and young grasses from extreme frosts, owing to there being no cover of snow on the ground.

The inhabitants of Annandale, though in the most southern part of Scotland, an with advantages with respect to soil and situation, have been longer of acquiring ideas of modern cultivation and improvements in agriculture than many other parts of North Britain. This does not seem difficult to account for. Annandale having been a Border country, the people were necessarily bred in the use of arms; and as they were subject themselves to frequent losses of their flocks and property by the depredations of their neighbours on the English side, so they often depended upon what they could acquire in the same manner. Though these immediate effects have long since been done away by the progress of political improvement arising from the constitution of the now united kingdoms, yet the effect that such a manner of life had upon the minds of the people continued long to show itself in every employment they followed. The people upon the coast carried on a trade in supplying the inland parts of the north.

north of England and south of Scotland with the commodities formerly imported into the Isle of Man *. Those in the middle part of the country dealt in buying cattle in the markets of the northern counties, and carrying them southward ; and some they grazed for a season or less time upon their own pastures. So impatient were they of any thing steady, that the horses they tilled the land with were seldom their property longer than three or four months ; and the cultivation of land was no further attended to than was necessary to supply the consumption of the farmer's family. The only steady management in Annandale was carried on in the upper parishes, where there were stocks of breeding sheep.

The dangers that arose from the situation of Annandale seem to have been the cause of a great part of the land being in common. The pastures for cattle were mostly in this state, and they were the more generally so as they lay near the Border. It was near the end of the last century before the laws of Scotland authorised the division of commons in any other way than by the same expensive manner still in use in England. It may have been from the same ideas of common danger, and to call attention to the general safety, that so much of the corn-lands lay runrigg, or in rundale property ; and that almost every farm was rundale in the corn-lands, and common in the pastures, among four, six, eight, or sometimes more tenants.

The people of a country so inhabited, and in such state, had many difficulties to get over, before the greatest exertions of individuals could make it generally capable of modern cultivation. But such exertions have been made. One proprietor was interested in twenty-two commons, and different tracts of rundale property under legal division at one time. There is now scarce a common undivided, unless where the interests of Royal Boroughs are concerned. They alone can claim the privilege of keeping waste tracts of the country useless to mankind ; an eye-sore to the benevolent passenger, and fit only to indulge the indolent occupier in brooding over his poverty and turf-fire †.

The management upon arable farms general to all Annandale for time out of mind was, that a proportion of the farm lying nearest the houses, called Infield land, was manured with the farm dung. The first crop was bear or big, which got two furrows, one in April, and the other in May, when the seed was sown. The second year was oats, and the third year oats. The next year it fell again to receive the manure, and gave bear, and so on in rotation. The quantity of Infield land was proportioned to the number of cattle wintered and housed on the farm. An acre of land might be dunged for each five or six cattle. The rest of the arable land of the

* This pernicious traffic ruined the morals of the people on all the adjacent coasts, and in the Isle of Man itself, in which have been found since the destruction of that trade a wonderful source of riches in their agriculture and fisheries ; and it is to be hoped, that Government will not permit their former trade to be revived.

† Turf is a sort of fuel very inferior to peat. It is the surface or vegetable part of ground, which has a mossy tendency. It may be pared off with a peculiar spade, once in seven years, or sooner, according to the vegetating power of the soil. The poorer people bestow a great part of the summer in casting, winning, and leading this fuel. By the repetition of this operation, the land is made greatly worse than the state of nature, by being robbed of the best of the soil. In many parts little else than stones are left.

farm was called Outfield. There was no manure for it but the dung of cattle folded in summer; and three successive crops of oats were taken. So a farm that could fold five acres of Outfield land, and could manure as many of Infield, had in all twenty-five acres of oats, and five acres of bear. The land in Outfield was, after the third crops of oats, allowed to rest in proportion to the extent of the whole.

Between fifty and sixty years ago an additional way of raising oats was introduced into Annandale. This was by watering the Outfield ley-lands, by rivulets being brought in upon the upper part of the field, and allowed to run over it. It was found to be efficacious in proportion to the rapidity with which it run, and the quality of the water; fine spring water being more fertilizing than that of temporary floods, or mossy water, though all were found beneficial in some degree. As this manure was not so commandable in the lower or flat parts of the country, it was most generally used in that part of Annandale lying in the third and fourth class of parishes.

This manure came to be in frequent use, and with great advantage, about thirty years ago. But it is not practised at present to so great an extent, owing probably to the more general use of lime, which has taken place within a few years past. The crop raised upon watered land was oats. It seldom failed in being productive for two years, and often a third crop was taken. Sometimes grounds were watered for meliorating meadow-grafts and pastures of all kinds, particularly dry and light lands. It had in all situations a tendency to eradicate the quickenings and coarser grasses; and to raise the finer, as white clover, daisy, &c.

It would not have been surprizing if this manure had been used in times further back than we have an account of the agriculture of our country. Wherever a running water overflows its banks, the land is visibly enriched, and specially so to the pastures. Wherever there is a spring, there is a verdure at all seasons, and the verdure is extensive in proportion to the rapidity and fineness of the water. Near the summit of some mountains a verdure of great extent is often seen, occasioned by one spring only. But if the water be of so large a body as to make a run or cut of the earth for itself, it cannot have the effect.

Forty years ago, and at a later period, the corns of Annandale were barely sufficient to maintain the people. Some quantities of oats and barley were sold from the parishes on the coast, to some of the English sea-port towns, in good seasons. but greater quantities were more generally bought in, chiefly from Roxburghshire. At this period the culture of turnip was unknown, unless to a gentleman who had travelled out of his own country. Potatoes were cultivated in small quantities only, and by the spade on ridges, and planted so close, that the roots came to no perfection, owing to the crops suffocating each other. The corn lands, after the crop was taken off the ground in autumn, were treated as a common, till the corns began to spring again in April or May.

There was scarce an inclosed field thirty years ago, in Annandale, unless on the mains or manour place of a gentleman, and there they were not at all frequent. There was no such thing at a much later period as a divided, or inclosed farm, with any sort of fence, occupied by a farmer. The obstacles to inclosing were many. In some parts of the country, stones of all kinds are wanting. In other parts where the stone was tried for inclosing, it was found to moulder and fall, some of it in less than three years,

years, and the greatest part in eight or ten years. This is a kind of unsubstantial rock, called rag-stone, which is chiefly in the middle parts of the country. In the first and second class of parishes, free-stone rock of different kinds is to be found, but not generally. In the third class there is only one workable quarry of this kind. In the fourth class whinstone is to be had, which makes a substantial lasting wall, especially when quarried. Yet they are not conveniently got in the lower parts of these parishes. Though the advantages of inclosing farms had been experienced, and no other obstacle to it than the nature and inconvenience of the stone, the fencing of fields in that way could have made little progress.

Rather more than twenty years ago, a little was begun by a few proprietors in the way of inclosing with hedges in different parts of the country; but it could not be general, while yet a want of knowledge of the benefit of it, and of skill in executing prevailed. A material obstacle also was the roads being unmade, and not upon permanent legal tracts. This was only obviated in the year 1777, when the first law was obtained for making turnpike roads, and raising an efficient fund for the parish roads of the county.

From that period, or rather from the end of the American war, the inclosing of farms has made great progress in Annandale, and more has been done in these ten or twelve years, than appears from the operations of all preceding ages.

In countries where sheep are the prevailing stock, it has not yet been found practical to bring up young hedges to a degree of perfection. Where young cattle are bred, and but a small proportion of the land kept in corns, the raising of hedges to be a fence requires so much care and so close attention, that many must fail of the success expected by the planter. The farmer who has extensive young hedges, and considerable numbers of cattle, cannot easily prevent thorns being trodden down, and gaps made. But he is not from such appearance to despair of success, if these failures are made up again in the spring, and the thorns cleared of quickening grass roots, and fresh earth clapt up to the thorn roots, after the second or third year, in place of throwing them bare, as is too generally the practice. And though the hedge should seem irregular, from five to ten years old, it will come to be a perfect good fence in a few years after, if the same care is continued; and especially if the land has a tolerable degree of moisture. In corn countries, where the land is kept chiefly under crop, less care is required to bring thorn hedges to be regular fences. The chief difficulty is in raising them upon very dry and sandy gravel, as a thorn makes little progress, and will be short-lived without a considerable share of moisture. Upon hillocks of sandy gravel, and other dry spots where fences necessarily pass; though these ought to be avoided as much as possible, it will be found advantageous to plant besides the thorns, a row of crab-trees, which grow with less moisture; or beeches, which do with less than either; and are not so subject to injury from cattle, as any other young tree. For raising hedges the more effectually, it has been found advantageous, that they be reared for seven years, at the equal expence of the landlord and farmer; the landlord keeping a man of skill for the purpose; and the farmer, or a man furnished by him, to work at least twice in the year, when called on. The farmer so engaged, becomes more interested in preserving the hedge; and the people in general acquire the proper methods of keeping clean, and nourishing the thorns.

In the first class of parishes the farms are now for the most part inclosed with hedges, and several farms divided into fields. Though these fences are yet far from being complete, they have had a remarkable effect upon the management of the farmers. They have led them into a more regular manner of laying out their manures; and of keeping their crops of a kind, together. The crops of barley have increased considerably. They are now for the most part sown after potatoes or turnip; and where barley land is not sown with clover and rye-grass seeds, the tenant is not accounted in the number of tolerable good farmers. A hay crop the first year, and sometimes the second, is taken; and it is not now unusual to see fields so laid down, lie for some years before they are broke up again for oats. After oats for two years, manure with a green crop, comes again. Such is the rotation followed by the farmers in most repute.

For many years past it has not been unusual for the most considerable farmers in this class of parishes to raise fields of wheat, which was generally done after fallow; and upon the loam and clay soils it has been raised with advantage, and of good quality. At a later period, from ten or twelve years back, when potatoes came to be raised in larger quantities, and with more facility, the smaller farmers had very generally crops of wheat after them; and some wheat grew in this manner not at all inferior in quality. It was extremely tempting to continue this practice. The crop of potatoes and wheat following, without additional labour or manure, was perhaps the greatest return yet known to be got from land at the same expence. But the practice is much fallen off, owing to its being found that these successive crops have been too severe for the generality of the soil; and that barley succeeding potatoes has been ultimately found more advantageous, from the valuable crops of hay, &c. that follow.

The rents of this class of parishes are chiefly paid from the sales of oats, wheat, and barley, particularly the latter; and it is computed that about two-thirds of the whole sales are from these articles; the rest from cattle and swine. The wheat now sold is not considered good, if under 60 lbs. barley 50 lbs. and oats 38 lbs. the Winchester bushel.

In the second class of parishes, many farms are also inclosed with hedges; but not so generally as in class first. The effects of these have also been considerable in altering the management of the farmers; and several particular farms are carried on in the same rotations as those mentioned in class first.

The corns raised in this class are chiefly oats and barley. Wheat is sown only in a few farms. The quality of the grain is nearly the same with that of class first; and the quantity of oats and barley is considerable; nearly one-half of the rent of these parishes being raised from them. Potatoes are cultivated in considerable quantities; and fields of turnip are not unusual. The other half of the rents are reckoned to arise from the sales of cattle and swine.

In the third class of parishes there have also been hedges raised, and the effect of the inclosing upon the cultivation of the land has been in proportion to the extent of hedges raised. Here too there are farms to be seen divided, and in regular rotation of crops, as mentioned in class first. The corns raised here, are also oats and barley, and some small quantities of wheat. The barley is not considered equal in quality to that produced in class first: but the oats are as productive. Potatoes and turnip are nearly in the same proportion as in class second. One-third of the rents

rents of these parishes is considered to arise from grain ; the other two-thirds from cattle, sheep, and swine.

In the fourth class of parishes there has been a considerable extent of land inclosed. In the parish of Johnstone alone, many farms containing together several thousand acres have been fenced round; some of them with walls of whinstone ; but much the greater part with hedges. Many of these farms are made from open moorlands, and considerable shares of them are now broke and brought into cultivation. In this parish, and in Wamphray and Moffat, there are particular farms to be seen divided, and in rotation of crops, with fields of turnip and other green crops ; and these laid down with barley and grass-seeds.

The corn raised on the lower or arable farms of this class, are on the average reckoned to answer the consumption of the inhabitants. The oats are of good quality, and little inferior to those in the lower part of the country. The barley does not fill proportionally so well, and there is yet a considerable quantity of bear or big sown in these parishes.

Barley, originally of the Norfolk kind, is now generally sown in the first and second class of parishes, and upon the farms of the other classes that are in any degree in regular rotations. Big or bear was formerly the only grain of that kind sown ; but within twenty or thirty years past, it has given place gradually to the barley, in proportion as the practice of cleaning land by fallow or green crops increased. Big is still found the more advantageous crop, where lands are in the old management, and that it is sown after oats with only a winter and spring furrow, having the dung-ploughed down. But by trials that have been made, where the land is tolerably good, and regularly cleaned, and in good heart, the bear or big comes short in quantity about 15 per cent. of what barley yields ; and the difference of price when bought by persons of skill is about 15 per cent more. Bear is more apt to lodge than barley, and so, not so proper for sowing with grass-seeds : but barley is about a week later in harvest. A Scotch acre * of land properly cultivated, is sown with four Winchester bushels of barley, or rather less ; and the return is from forty to fifty bushels : sometimes more, as the land is high in order. The seed-time is from the 5th to the 15th of May ; and harvest from the second week of August to the first week of September.

The small gray awned oats were the common produce of Annandale, till within these forty years. In the highest or fourth class of parishes, they were frequent within twenty years ; and there are still fields of them to be seen on some high farms. White oats only have been sown in the first and second and lower farms of the third class of parishes for many years, and now there are no other. The average return by the old management was reckoned no more than three seeds. On cultivated land it is now generally five, or forty-five Winchester bushels to the Scotch-acre. The seed-time is from the middle of March to the middle of April.

Oats from Poland and Friesland have been sown in small quantities for many years, but they were not generally known till after the year 1782, when the crops were late, and overtaken by the frost on the 5th of October. Since then they have

* A Scotch acre is about one-fifth more than an English, being 660 square yards four feet ; an English acre 4840 square yards.

been sown upon many farms, and have been found to make a productive certain return upon strong land, if in good heart, and to be sufficiently early, though upon the highest grounds in use to be cultivated. They have not been found to answer so well upon light soils. They are reaped commonly in August, or beginning of September: the seed seems to require a renewal, probably from a new importation, in three or four years. They come gradually to be later, and the difference is remarkable in seven or eight years. The greatest objection to them is, their aptness to shake; but it has been observed, they are the less so, and lose in the size and quality of the grain, as they are the more frequently sown. Another kind called red oats, used for a few years past, are said to have the advantage of not shaking, and of being equally early with the Polish oats. But these are not yet in general use.

It has been found advantageous upon particular farms, to have both the late and early oats. It insures part of the oat crop against the chance of early frosts; and it divides the labour of the harvest: a material circumstance for a farmer not within reach of a market for reapers.

It has been considered a general fault in the farmers of Annandale to run too much upon oats. By the old management they could not do otherwise; and it must be confessed they are still too ready to do so. When they break up land laid down in heart, they are apt to go on to a third crop of oats, which impoverishes extremely, and runs the land again into quickening and knot-grafts. They do not consider the great labour of destroying these again, and the difficulty, or rather impossibility, of restoring the land without expensive forced measures, which cannot be afforded nor given with the same efficacy every time the land falls to be laid down. Even with two crops of oats, the generality of land will take extreme full manure, with green crops or fallow, to keep it in such heart as afterwards to produce good crops of barley and hay, and tolerable pastures.

Without two crops of oats, it has been found that farms depending both on corn and cattle, and not within reach of town manures, are not properly manageable. In such situations oats may be considered the sinews of farming: besides a great portion of them being necessary in these northern counties for the food of man and horses, it is found that no other grain is so proper for feeding cattle and swine; or to furnish such good meat. The straw of oats is good winter fodder for work horses and cattle, especially when green or succulent food is given them at the same time. Both together are nourishing and healthful.

It has hitherto been found that young cattle which are to be sold to the grazier, who disposes of them to the feeder, cannot be afforded the hay of sown grasses; nor will it give so proper a constitution for adapting them to the improvement required by the ultimate feeder, as the hay of the bog or coarse meadow, when cut in the sap; or oat-straw with green food in the winter and early spring months. The effect of the latter is surprizing in fitting young cattle to set out upon immediate growth, when put upon tolerable pastures in the spring. It would seem, when they are fed upon dry fodder only, that the veins and sinews acquire a firmness which must again be relaxed before they begin to grow.

The high price of labour for some years past, which affects the corn farmer as much as any man, has added to the ideas that have been generally growing of its being more advantageous for farmers to breed and graze cattle than raise corn. These ideas may no doubt be better adapted to the west side of Britain than the east; since

the moisture of the west is more favourable to pastures ; and the drought of the east more so to corns. But on either side it may readily, and it is believed is now carried to the extreme. This seems a consequential matter to farmers. In raising corn it appears they are chiefly affected by the price of labour. If they can afford it, their risk otherwise is small. It is true, the price of grain fluctuates ; but as it is in general owing to the favourable or bad season, either the price or the quantity makes a compensation. There is generally a market, and a slow one for some weeks, or even months, may not much oppress a farmer tolerably accommodated for keeping his grain. Cattle come sometimes to high prices, advantageous to breeders and graziers : but it is generally in the hey-day of the prosperity of manufactures. Every stagnation in these brings the prices of cattle down. The manufacturer with half work, or half wages, will lessen his portion of the fats of the earth before he gives up his daily bread. Many circumstances, as droughts, storms, failures of hay crops or of turnips, &c. make temporary falls of cattle, that affect the farmer : they cannot perhaps for a week keep their stock on hand ; and then, above all, the dealer must be trusted, often not a sure man. There seems little danger, that Britain can ever run far short of butcher's meat. Much of the natural pastures are good, and the improved ones increasing. If the prices of butcher's meat, which is used to a degree of luxury among all ranks, should rise, it will little affect the manufacture or labour of the country. When the price of it is high in the extreme, it is more so from the fictitious superabundance of money, than from a scarcity of meat. It is very different with corns. The price of it has been at the highest when money has really been at the scarcest. A calamitous season or two in time of war might bring irreparable woes upon the families of the poor tradesman and labourer. The raising of corn seems to deserve every public encouragement that can be given ; and it would appear to add to the security of the farmer, as well as of the State, that in every favourable situation for raising corn, he should depend at least in part upon it. In the years 1782 and 1783, the corn farmers of the three lowest classes of Annandale made more money than ever they had done before in the same space of time.

The culture of potatoes seems to have given the first ideas of improvement of land to the farmers of Annandale. Fallow was unknown, and could not at any rate be practised, where farms were possessed rundale. They were not at first sensible of the advantages arising from the destruction of noxious roots and seed-weeds. They thought the deficiency of stubble-graiss in the crop of oats, that succeeded, was a defect that arose from potatoes being an impoverishing crop. It was not till after they ventured to sow flax-seed, barley, and wheat, after potatoes, that they came to be raised in quantities ; and it was then they contrived to plant them with the plough. It is near fifty years since this great improvement was begun in Annandale, by JOHN SYME in Redkirk, in the ministry of Graitney ; and notwithstanding his returns were the wonder of the neighbourhood, the laborious unproductive method of planting in beds with the spade was generally continued for more than twenty years after. Improvements of the most obvious and advantageous nature will make little progress in the beginning among people who derive all their knowledge from the practice of their fathers, whose employments restrict them to their homes. Such people require to have the practice of improvements brought immediately and repeatedly under their eye before they attempt to follow them.

Potatoes

Potatoes are now raised every-where in Annandale with the plough only. The ordinary way of preparing the land is by a winter furrow on oat-stubble. Crofts ploughed in the spring. Ploughed again and smooth harrowed. The land turned into ridges of four furrows, making in all thirty-eight inches wide. The potatoes are planted between each ridge: the dung laid in every third furrow serves three rows. If the land be a light dry soil, it answers well to spread the dung above the plants. If a heavy soil, it will do best to make the furrows shallow, and plant the potatoes above the dung. They are covered with a single furrow on each side. When the potatoe crops begin to appear, the other furrow is laid to and harrowed. When weeds come up, a furrow is taken from—when weeds appear again, the crops are hand-wed, and a light furrow laid close to them. When the crops grow strong, and before they come near closing, the furrow is cleaned out, and laid as high and close to the crops as the plough can put it. The rule for the width of the rows or drills of this and all other green crops seems to be the distance at which the crops will meet. This appears necessary for bringing the crop itself to perfection; and also for the stagnation of air, which it is believed brings strength or manure to the land. The ordinary season of planting, is from the middle of April to the middle of May: they are taken up after Michaelmas, as soon as the crops lose their verdure and become withered. A Scotch acre of land in tolerable management yields two hundred Winchester bushels of potatoes, making about seven tons of clean potatoes: some considerably more.

Potatoes raised within a few miles of the shore, find generally a good market at the sea-port towns on the west of England; and sometimes on the west of Scotland. Besides those used for food by all people, potatoes are given to cattle, both for milk and for feeding. They are also given to horses, and answer a good purpose when they are upon white fodder. Ten pound weight of clean washed raw potatoes make a moderate feed for a horse. But the most general use made of potatoes is for feeding swine.

Turnips raised in Annandale are all sown in drills, and horse-hoed. The land is prepared in the same manner as for potatoes, only it requires an additional ploughing and harrowing. After the dung is covered by ploughing in both furrows to either side, and harrowing them smooth, the seed is sown with a drill-plough, directly above the dung. When they are sprung an inch or two, they are thinned with a five-inch hoe, leaving three or four plants, of which the choice is left, when they grow a little stronger, and are picked by the hand. A furrow is then taken from them, and the weeds near the plants destroyed with the hoe. When weeds appear again, a light furrow is laid to; but it is not thought proper to let the earth cover the young turnip. It is found to make more progress when exposed than when the root is wholly under the earth. The main circumstance for bringing it to a large size, besides a quantity of moist dung under the root, is to keep the soil open or loose.

Turnips are commonly sown from the 20th of June to the 10th of July. There has not been much particular trial made of the weight that grows generally; but it is reckoned not to be less upon a Scotch acre of good regular turnip than thirty tons.

Turnips are used for stall-feeding, but more generally are given to milk catt'e in the autumn, and beginning of the winter, and to young cattle. Turnip is found to be

be the best green crop fallow for destroying seed and root weeds. This is probably owing to the effectual ploughings which may be given before so late a seed-time, and to the loose texture in which the land is kept the whole season through ; and the constant verdure and succulence of the plant prevents its exhausting so much of the manure as other crops that are lets so. Turnips are sometimes affected by the fly in Annandale : the best remedy hitherto practised, is sowing them particularly thick. As the fly does not act upon them for more than three or four days after they come up, enough remains after the fly has done all in its power. Two libs. of seed to an acre will sow turnip very thick in rows thirty-eight inches wide ; and the plants grow the stronger from being so thick till they are ten or twelve days old, when they ought to be thinned.

Cabbages are pretty generally grown in some parts of Annandale as a farming crop, but not in large quantities ; some four or five thousand ; and particular farmers have from ten to twenty thousand. The land is prepared in the same manner as for turnip ; and the plant set from twenty-four to thirty inches distant. The furrow is taken from, and laid to as the weeds spring, and particular work is necessary for keeping the stocks clear of quickenings and knot-grafts roots. An acre will take from seven thousand to eight thousand plants ; and if the grow this regular and good, they will weigh from fifteen to twenty tons. They are used to advantage for stall-feeding ; but they are more generally given to milk cows in the autumn, when the graft fails. They add to the quantity and quality of the milk ; but it is necessary to strip off the rotten and discoloured leaves to prevent giving a bad flavour to the milk. These may be given to young cattle. Cattle not fed out on pasture, and milk cows put dry between Lammas and Michaelmas, are made fat upon moderate foggage by Martinmas, by giving them cabbages on the field in the evening. Eight or ten of tolerable size serve a cow for a night. No other green crop seems so suitable as cabbages for clay lands, which are too stiff for bringing potatoes or turnip to perfection. The obstacles to raising cabbages in the field are, the high price of plants, which cost generally twenty shillings for an acre ; and the inconvenience of getting them at the time the land can be got prepared. These can only be obviated by the farmer's raising his own plants, which he may easily do in a corner of his garden : a pound of seed, costing half a crown, in moderate thriving will yield ten thousand plants. It should be sown the last week of July, or the first of August. The greatest danger of loss of them is from small birds, when they are coming above the ground : they should be then watched for two or three days, particularly in the morning before sun-rise. They ought not to face the morning sun, which is destructive to them in the spring frosts. It does not either require much attention to raise cabbage-seed. A few stocks earthed up in the garden in November, will produce some pounds of seed. The chief care to be taken is to preserve the seed from small birds when it begins to ripen. It requires a good exposure and shelter from the cold winds, being naturally a late seed.

In the old management no manure was used, as formerly observed, but what fell from the cattle of the farm. The introduction of watering land for raising oats added much to the grain raised in the country. It also improved in a visible manner the pastures after crops of oats were taken, though no watering was used. It is to be regretted, that this natural melioration had not been more practised ; but it may reasonably be hoped it will be so, when it becomes observable to the generality

of farmers, that the most essential end of all improvements is to enrich pasture; not only for the immediate return from these, but also for raising good grain; and this is probably not distant. The improved roads and facility of obtaining lime was much the cause of water-manure having fallen partly into disuse, and that it could not so visibly and conveniently enter into the system of green crops, barley, and sown grass, as lime.

The main body of lime-stone in Annandale lies in the first and second class of parishes, and runs from north-east to south-west, in a line which lies about one-fifth of the country on one side, and four-fifths on the other. From thirty to twenty years ago there was very little of it used for land. It was then only burnt by particular farmers with peat for their own use. About the latter period draw-kilns were set up for serving the country with lime ready burnt in shells, and the demand from the farmers soon became general. This regular supply has much facilitated the improvement of land, so far as carried on. The ordinary quantity used for an acre of dry land, is one hundred and twenty Winchester bushels of shells, weighing four tons. A bushel of shells makes two bushels of powdered lime. Stiff clay soils take more, and seldom get enough. The price at the kilns is from three-pence to four-pence the bushel; and it is carried as far as twenty-four miles for laying on land.

The most general manner of using lime as a manure, is by laying it on ley land to be ploughed for oats, and a common error is the ploughing it down too soon, before it gets hold of the upper soil. The benefit of it for the first crop is by this means lost, and as it is laid or falls below the farrows, it never after comes to be effectually raised and mixed with that part of the soil that feeds the crop. Where lime is allowed to lie two years before ploughing, and mix with the soil at the roots of the grass, it is found more useful and lasting. The next best manner of using it, seems to be by laying it on fallow. There the effect is more immediate; but it is also apt to get too deep, before the best and most useful part of the soil is sufficiently benefited.

Marl of the shell kind is found in different parts of Annandale; but it is not got in large quantities. It is used in the same manner with lime.

Composts of lime, earth, and dung, are made by particular farmers, but they are rare in any part of Annandale. The common use of lime as a manure has yet been so short a time practised, that a renewal of artificial manures has not been generally required. After it is so, and that it shall be found that lime alone does not operate with the same efficacy when repeated, it is to be hoped that the farmers will lay their minds and hands to devise and make up composts of the various materials afforded by the country, as clay, moss, old dykes, scourings of ditches, weels and noxious vegetables, of which abundance are to be had.

The feeding of swine has become a material article in farming in Annandale. The market got for the potatoes which grew near the coast, and the facility by which they were planted, hoed, and raised with the plough, encouraged the raising such quantities as made a superabundance in warm dry seasons. Swine came to be fed with them. Now a great many potatoes are raised for that special purpose. Swine have been bought in pigs from Yorkshire and Bishoprick's; and are kept from six to ten months. They are then sold from fifty shillings to three pounds, weighing from two or three hundred weight. They are disposed of by the farmer to the dealer, who

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dries and smokes them through the spring. He sells the hams for the London market, and the fitches for the Newcastle shipping and colliers. Swine are fed in the summer season partly on grafts and whey; but chiefly through all the year on potatoes; but when feeding off, they get corn, commonly the poorest oats and barley. Swine are now frequent over all Annandale, but they are more generally so in the first and second class of parishes. About the year 1770 this article brought into Annandale not more than five hundred pounds. It is now reckoned to bring above twelve thousand pounds yearly. The hams, it is said, still pass in London under the name of Yorkshire: they are reckoned good, owing it is supposed to the clean food, and thorough drying. They are hung up in the houses of the small farmers and cottars, exposed to the smoke of their peat-fires. It is not doubted but these hams would prove still more excellent, if they had the advantage of being cured with refined rock salt in place of the Scotch marine salt. But by some unaccountable distinction in the laws, the people of this country are denied that advantage upon the same terms they have marine salt, unless by smuggling rock salt from Ireland; a practice which, tho' general further west, is here yet little known. The farmers have also within these few years begun to breed swine, and if it becomes general to the extent of the demand, it will prove a considerable advantage to the country.

Stall or winter feeding of cattle or sheep, is not hitherto much practised in Annandale. This is probably owing to the want of market. The only towns within fifty or sixty miles are Dumfries and Carlisle, and these are abundantly supplied by extensive tracts of country, which lie nearer, and depend upon them. Edinburgh and Glasgow are seventy or eighty miles from the centre of Annandale, and the access over mountainous countries is not certain in the winter and early spring months. This is a disadvantage to the cultivation of the country, by lessening the encouragement for raising green crops. Without these the quantity of manure must be small; of course the quantity of barley and sown grafts must be proportionally so. But it is a disadvantage from local situation, and the remedy is not obvious.

The feeding of cattle fat upon pastures is not much practised, from the same cause that winter feeding is so limited. Here there may be some relief. The country lies open to exportation, and if it was enabled to contribute to furnish the Navy, and supply our colonies, it might be advantageous in different views; but this is prevented by the laws. Unless the drawbacks on salted beef and pork are equalised to the drawbacks in England, and also equalled to the high additional duties laid on salt in 1780 and 1782, these articles never can be exported from Scotland.

If this and the neighbouring districts of the west coast proceed in improvements as they have done for some years, there must be a great extent of cultivated pastures fit to feed quantities of meat far beyond the consumption of the country. It would be a waste to breed young cattle on these; and there will be for ages natural coarse pastures better for that purpose. If there is not freedom of exportation for salted meat upon liberal terms, there must be a check to the improvement and produce of which the country is capable. Manufactures have gained little ground in the districts of Scotland. Without these much additional population cannot be expected. Both would, no doubt, add to the wealth and power of the united kingdoms, though little perhaps either to the health or virtues of the people. It probably never

never will be the case, that these districts can consume their natural produce; but the more it increases, it must add to the independence of the State, which ought probably to be the first object of the laws. That the people and wealth will however continue to increase in most parts of Britain, there is little room left to doubt. As they do so, the minds of men and political circumstances must change. May Heaven direct the Legislative bodies of these isles to watch the successive progress of such changes, and temper the laws civil and political to them, so as to avert the convulsions which we are taught, by the present and preceding ages, must otherwise ensue.

Though the dairy, so far as necessary for the consumption of private families, has been known to produce in Annandale cheese and butter of good quality, yet the use of it for supplying other parts of the country has been very limited. Till within these few years, no other was made for sale but from the milk of ewes; and that was only upon the store or sheep-breeding farms in the head of the country. The quantity of cheese made some years ago was not inconsiderable; and the price it sold for was high: the ordinary rate of it when green was two-pence; and when kept two years was as high as four-pence the pound Avoirdupois. It was then the general practice to milk ewes for six weeks after the lambs were taken off them. But this has been found hurtful, particularly to the sale of draught ewes; and most farmers have now restricted the time of milking; and some have given it up wholly.

A gentleman who has considerable property in Annandale thought the country suited to the dairy; and that it might become an advantageous article in farming. He encouraged with great zeal and liberality, people reputed of skill from Cheshire to settle on his estate in Middlebie, Hoddam, and Dornock. Different farmers of them set out in the business with the prospect of success, and who for some time acknowledged that every favourable circumstance necessary for it attended their situation, particularly the quantity and quality of the milk given by the cows of the country. The cheese made was equal to the best Cheshire, and there was no want of sale: but it turned out that these people had been rash in undertaking a business far beyond their stock; and that they were not persons of industry and prudence in other respects. One of them is probably an exception to the others in all respects. He continues the business, it is supposed successfully. Whether these strangers succeed or not, the laudable purpose of the honourable promoter will not be wholly lost. The people of the country have already profited by the superior skill shown to them. Many follow the Cheshire manner; and though generally upon a small scale, it is probable the dairy farming will rather increase than diminish.

Within these few years a dairy has been set up in the parish of Johnstone, in the Ayrshire manner, by a native of that country. The good quality of his cheese, as well as his success in all respects, is acknowledged; yet he has hitherto been little followed. This man is endued with every quality that the unsuccessful dairy-men wanted.

It seems to deserve notice, that when the dairy excels, the cattle are found not to have the qualities of what is commonly termed a good breed. The cattle known to be true good feeders, and of the figure and hair which denotes their being so, are seldom found to be good milkers. These rules, however, are not without exceptions; and good milkers are sometimes found of the good feeding kind. It would be a con-

sequential matter in farming, if from these particular exceptions a breed could be selected, partaking of both qualities. Such improvements have been made in the breed of useful animals as authorise the attentive farmer to attempt every thing his fancy leads him to, where attention alone is required, and no outlay or risk of property. This seems to be one of these cases.

Sheep were fifty years ago, and within less time, considered the staple of Annandale. Before the commons were divided, they made a great part of the stock of almost every farm over the whole country. But as these divisions took place, the sheep came to be restricted ; and more latterly, as hedges came to be raised, sheep have been almost wholly driven from the lower parts of the country. They are now kept in regular breeding stocks only, in the fourth class of parishes, and on a few farms in the upper part of Middlebie and Tundergarth. But on many other farms of these parishes, and on particular farms of class the third, it is a common part of management to buy in lambs at Lammases, and sell them off in June the next year in hogs * before they are fleeced. This is also done in particular farms of class fourth ; and it is not uncommon there to buy in wedder hogs, and sell them out in dimmots or two-year-olds.

The character of the sheep of Annandale lost nothing by their being given up in the lower parts of the country. Many of the pastures there were not suited for them, and the sheep were in such bad management that they were very inferior in quality, and far from being sure stocks. It was not so with the sheep in the upper parts of the country. Those lands now under breeding stocks have been in that state from the earliest accounts of the country ; and their sheep were equal to the best Scotch sheep in point of character and prices. These original sheep of the country were a horned, black-faced and black-legged, and coarse-wooled sheep : they are straight in the limbs and back, round in the rib, and well set up in the shoulder. They commonly get the name of short sheep. In the whole of class fourth they continue to be the same kind, excepting one farm on Moffat Water, and four farms in Hutton and Corrie, where there are extensive stocks of the kind called long sheep. These are without horns, white-faced, fine-wooled, and apparently longer in the body than the black-faced sheep. The stocks on the upper farms of Middlebie and Tundergarth are also of this kind, excepting one stock only.

By the management of all these stocks, the lambs are dropt in the beginning of April, and are taken off in July. They are sold then, or in the beginning of August, retaining only what are necessary for keeping up the stock. It is not unusual to retain the greater part of the ewe-lambs till they are year-old, keeping then what is necessary for carrying on the stock ; and this last is reckoned preferable, as the choice of the best breeders is more certainly made when they are so much further advanced. In August or September, the old or draught ewes are put out ; and in the end of October or beginning of November the whole stock is smeared with an ointment of tar and grease. They are found by this application to stand the winter, and retain their wool the better. The vermin is destroyed, and the wool itself is thought to become of

* Young sheep are called hogs from Martinmas after they are lambed till they are fleeced next year, when the wedder sheep get the name of dimmots ; and the ewe-sheep are called gimmers ; and these names continue till they are two years old.

a more smooth and pliable texture. Much has been said to convince the farmers that smearing is unnecessary. But practitioners agree in its having the effects mentioned ; and that in high and bleak exposures and rainy climates the constitution of the sheep is fortified by it. It, no doubt, adds to the labour of preparing the wool for manufacture, and it is unfavourable to the dye of bright colours : but this last is of the less matter where the wool is coarse. In low cultivated parts of the country, where sheep are kept in small numbers only, and not allowed to fall low in condition, smearing is not practised.

People are much divided in opinion as to the advantages that attend these two kinds of sheep. It seems generally thought, that the short or black-faced sheep are the hardiest, and the farmers of the north of England give them a decided preference for their high bare commons. It is as generally believed, that they are the best mutton, when brought aged and well-fed to the shambles. It must be confessed that the white-faced sheep have rather gained ground in the country for some years past ; and that the superior hardiness of the black-faced sheep, where the breeding stocks of them have neighboured each other, has scarcely been distinguished. It is theoretically argued, that the long sheep must stand most cold, because their fleece is the finest and closest. But it may rationally be answered, that the use of this warm fleece in the autumn and winter, when the sheep is in full condition, will render it the more delicate in the spring, when it becomes lean, and the cold still continues. It has been observed, that the price of the long sheep only exceeds that of the short in times when the demand for wool is high ; and that short sheep have as good and regular a sale at all other times ; and the most so, when from bad seasons sheep are noticed to be slack, and a rot dreaded. This, however, may arise from the long sheep inhabiting generally wetter lands than the short sheep do. The sale for the white-faced sheep is generally in a different part of the country, being lower down in Bishoprick and Yorkshire ; and while thus the demand for these different kinds of sheep is from farmers in opposite situations, it seems prudent on the part of the Scotch breeders to keep up the stocks required to supply both of them. It is generally thought that the long sheep consume rather more grain ; and that they require a deeper soil to keep them at their natural bone. But no special experiment of this has been made, though it seems very practicable.

It has been observed, that there has been as regular a demand for all the coarse wool in this part of the kingdom as for the fine. This seems to show, that there are purposes for which this coarse wool is required ; and if there was only the finer wool to be had for these purposes, probably the manufactured goods could not be afforded so low as to promote a sale for them. As lands are cultivated and inclosed, which seems to make a rapid progress in North Britain, the breed of finer-wooled sheep will in all probability increase ; and they will then more certainly succeed. It seems therefore the less material, though the high and bleak mountains should be left for the short sheep, and those who have an idea of the superior hardiness and quality of them.

One of the stocks of white-faced sheep in the fourth class, and in the parish of Hutton, is of the Bakewell kind, having been bred from a good stock, which originally was a mixture of long and short sheep with Bakewell rams. They were begun to be crossed in the year 1777, and have been continued with good rams ever since with particular attention. They are now probably the most complete and extensive stock

of the Bakewell blood of any in North Britain. They are found to thrive equally well with any other breeding stock in the district; but it is to be noticed, that they are rather the lowest situated. The prices of the lambs and draught ewes of this stock is a little above that of the best other flocks: but the breeder thinks he does not come at the true value of them, owing to the want of resort in his markets of the proper buyers. This is a loss which persons who introduce new produce generally meet. They have not only the expence and attention required for bringing new trials to perfection to pay, but have also a new market to make. From this it follows, that they are generally the more successful farmers, who improve the species of stock or produce formerly used in the district they reside, than those who run upon new species, though these should be the better or most approved, and the soil and climate fitted for bringing them to perfection. But this may not hold, where a market for the new species is certain. The most evident superiority of the stock mentioned, lies in the wool. The quantity is equal to two-fifths more than from the same number of any other stock of long sheep; but the price is about one-fifth less.

The diseases of sheep is a matter interesting to farmers, and seems to deserve more of the attention and study of mankind, than it has had bestowed upon it. The average annual loss of sheep by diseases in this part of the country is not reckoned less than 25 per cent of the rent payable to the landlord, or about 6 per cent of the stock. Particular farms are in a great measure exempted from diseases, which is reckoned to be owing to the soil and kinds of grass they produce. This shows the diseases not to be epidemical. When lambs die immediately after being dropt, it is commonly held to be from weakness, though on particular farms they soon shew a tendency to take the trembling, and some die evidently of it. No cure or preventative is attempted. In the autumn and winter, when lambs are about six months old (then called hogs), they are subject to the most mortal disease that affects them at any period. It is called in this part of the country *the sickness*; further west it is termed the *brackfe* or *braikfeaw*. They are commonly seized with it at night, and are found dead in the morning; no previous ailment being observed. Commonly the bowels or a particular quarter appears more affected than the rest, and seems in a state of putrefaction. The whole of the flesh is generally eat; and those accustomed to it, say it is neither unwholesome nor unpleasant; but to others it is very nauseous. It is often the strongest and fastest of the stock that are affected, and it prevails most where grass is rank and rich; and particularly where the grass has been shaded with ferns. They are observed to be most frequently seized in times of hoar-frost. There is no farm but has some loss by this disorder; and some have a loss to the extent of 15 or 20 per cent of their stock of lambs. There has been no cure tried for it, nor could any be applied, as it is not discovered till too late. The only preventative commonly used is changing the stock to clean grass; and often that has little effect. Where lambs or hogs have been early set upon turnip, it has been observed, that few or none of them die of this disease. It would seem to proceed from an over-richness of blood; yet some, and but a few hogs die of it in the spring, when they are lean. Some sheep die of it at two years old; but it is seldom they are seized at that age. It is not unlikely but preventatives for sanguing or thinning the blood might be effectual against this disorder; and very possibly such might be applied without great difficulty. People have not attempted any such, probably from a backwardness in using medicine before a distemper, or any

any certainty of it appears. Experiments for this purpose, or by particular management of pastures to prevent this mortal disorder, and at the same time not to injure the constitution of the animal, wou'd deserve encouragement. Aged sheep are subject to a disorder called the trembling, which seizes them in the spring. It seems to partake of the palsey and ague. Many of them do not immediately die of it ; but after being struck powerless in the limbs, retain ability to eat, and often linger for months ; a few only recover. Some people give them warm milk immediately after they are seized, and continue it for some time. Aged sheep in the summer season, and most commonly in hot weather, take a disorder called (in this particular district) the *braikshaw*. It affects them by a scouring or flux, and proves very mortal. Sheep are apt to take it, if they are frightened and run much by dogs. It is thought to be infectious. No cure is effectual. The sturdy, or water in the head, is very mortal among young sheep in particular seasons. When the water is thought to be gathered immediately above the nose, they are probed with a wire ; and if the water gets away, they often recover. It is not uncommon to make an incision in the skull, where the water is observed to affect it ; but before that is observable, they are too far gone, a mortification is begun, and very few recover. Without such attempts, however, their death is certain. If they are tolerably well in flesh when first discovered, it answers the best purpose to kill them immediately : or if they are put in good pastures inclosed, they often get into better condition before the disorder comes to a height. The scab has been a destructive disorder, when it got among a stock. The rubbing with tobacco and broom juice, and even with sulphur, generally answered little purpose. There was no certain cure known till lately that Sir JOSEPH BANKS's was published in the newspapers. A farmer in this district, after having had great loss, and using every former application known to him without effect, tried Sir JOSEPH's cure, which he found most efficacious and satisfactory. It cleared his whole stock in the space of a few months *.

The cattle of Annandale about fifty years ago were generally horned, not well set in the limbs, and were rather small in the bone. They had great disadvantages by so much of the pastures being common ; and the winter fodder being no other than straw, without any green food. Where natural bog meadow hay was most produced, which was chiefly in the east and upper parts of the country, the cattle were strongest and best ; but they were inferior to the Galloway cattle in figure, and in character for feeding ; and to the Tiviotdale in size, and for milking. About the time mentioned, the people began to introduce Galloway polled bulls ; and some who lay on the east side of Annandale got in milk cows from Tiviotdale.

- * This prescription was,
- One lib. quick-silver.
- Two lib. hogs-hrd.
- Half lib. Venice turpentine.
- Half lib. oil or spirit of ditto.

The whole to be beat, wrought, and mixt together till made into an ointment. The parts affected to be rubbed with a small bit, about, or less than a hazel nut. To prevent a flock of sheep from being infected, rub a few sheep by laying the ointment on in a stripe from the neck down the back to the rump, a stripe down each shoulder and down each hip.

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The cross breed from these made a great alteration in the cattle of Annandale; and the improvements in parts of the country in latter years have added to the present quality of them. They are now well set up in the limbs, straight in the back, and round in the rib; and very few are to be seen with horns. The aged cows when fed, weigh from four to five hundred weight the four quarters. No bullocks of the country breed are killed or fed in it. The kinds and quality, however, are different in the different parts of the country. In the first class of parishes, very many of the calves are fed and killed; and those bred, have a considerable mixture of the Cumberland horned cattle. In the second class, a few calves are fed; and some of the cattle have a mixture of the variegated colours and appearance of the Cumberland kind. In the third class, they are more of the dark Scotch colours; and still more so in the fourth class: and there all the calves are bred. The young oxen are sold between Lammas and Martinmas, after they are a year old; and are commonly bought by the Galloway graziers. The price varies much, according to the quality, and the times. They are so low as thirty shillings, and so high as five pounds. The heifers are kept till two years old out, and are sold in the north of England. Though a year older, the price is only about the same with the ox: but the latter include the prime of the stock; and of the heifers, the best are retained for keeping it up. Of both kinds, the dark colours are preferred; and if they chance to have horns, they are reckoned 20 per cent less value. Notwithstanding the improvement of late years in the cattle of Annandale, they are yet certainly capable of much more; and it must be confessed, that the generality of farmers are deficient in care of making a proper choice of bulls.

In the lower farms of class fourth, and on the east side of class second and third, where bog and meadow hay is made in considerable quantities, it is common for the farmers to flock a great part of their lands about Michaelmas with stots or bullocks, bought mostly in the northern counties. The most aged of these are sold in the spring, and driven as far south as the neighbourhood of London. The younger or small part of them are grazed through the summer, and sold to dealers, who carry them to Yorkshire. This way of farming is considered very independent of the vicissitudes of markets. If the farmer should sell at a small price, he buys in proportionally low, and his returns are according to the goodness of his keeping; but it is attended with great drawbacks. It leads the farmer too frequently from home, and in the way of dissipation. It connects him too much with the dealer, who, as he gets the whole stock in his hands, and not a yearly cast or produce, too often leaves the farmer unable to go to market again for a new stock, or to pay his rent. The dealer who buys the spring stock carries on a business precarious in the extreme. The distance of time between the buying and selling, owing to the long drive, must make the price to be sold at, uncertain. Stormy weather may set in on the road, which prolongs it still more; and if an early vegetation is checked by a drought, the fall of price is certain. Should the rise of price be waited for, the expense is ruinous. All these mischances are sometimes reversed, and then the profits are great. This is the temptation for carrying on soadventurous a business.

This particular mode of farming, by changing so frequently the stocks of cattle and sheep, and the local situation of the country, central to the sellers of the north and buyers of the south, leads many of the farmers to become dealers; and the rest of them into frequent transactions and engagements, which prove embarrassing, and oft-

ofttimes fatal to their credit. This appears to be much occasioned by the extraordinary circulation of paper-money. When a glimpse of prosperity shines on the country by a quickening of trade and manufactures, and all degrees of people seem to vie which shall carry their business highest, the circulators of *bank notes* outvie all others. It is not enough for a company of traders or manufacturers to find credit themselves to carry on their employment, but they give credit on the public to hundreds of others who never dealt in their proper line of trade. In order to extend this business of circulation, they place agents in distant corners of the country. These for the purpose make dealers, and none are more frequently created than the dealers in cattle. They come with their pockets filled *with money*, as it is called among the unwary farmers. They gain upon their confidence by this show of affluence, and induce them also to give them credit.

It is not farmers and dealers alone who suffer by this over-ready access to paper-money. All ranks of people become in a manner intoxicated by it. They fancy they can carry every thing before them ; and that there are no limits to their prosperity. The great speculating manufacturers bid up the wages of the journeyman ; and he, by gaining a double portion of this ideal money, goes the half of his time idle, fancies himself robbed of his natural rights, and that he is entitled to share with the peaceable occupier the fruits of the industry of himself and his ancestors. Such is the excess to which this unlimited circulation carries all things ; and when the bubble bursts, many individuals, who did not even think themselves concerned, come to ruin, and a real injury to the State ensues. The farmers of some districts of Annandale have been known, after times of high circulation of paper-money, to have lost by dealers not less than two years rent in seven. There does not appear to be an object more deserving the attention of parliament than this. If the trade and manufacture of this country, lately carried to so great a height, had been limited to some reasonable proportion of the real funds of the concerned, they would in all probability at this day have stood in greater prosperity than they ever did before. It is not the war of a year that could affect them. If there was a legal prohibition upon all notes, issued by private companies to bearer called bank notes, until a sum of money shall be deposited in the national funds equal to a third or fourth of the sum to be circulated, it would be so far a security to the public ; and evidence in some degree, that the issuers were not entire speculators.

How vexatious has it been to many people in business and public employments, to receive great varieties of notes of new-set-up bankers whom they never heard of, and many of whose characters they could only hear of with doubt ; and what inconvenience and loss have hundreds felt by them ultimately ! Some such notes have proved no better than the Birmingham shilling, which on a day's wearing shows itself to be copper ; and much more serious are the effects of the circulation, both to individuals and to the public. The banker who would issue more than the proportion allowed by law to the fund deposited, ought to be subjected as a felon.

The breeding of horses is not an inconsiderable article to the farmers of Annandale. They are much given to change horses, but are good judges, and careful in buying in mares to breed from. They get them generally from the west counties of Clydesdale, &c. Some years ago it was reckoned they were much given to crossing them with blood or small-boned horses ; but they are not thought in that fault now. They commonly select stout horses, but prefer the active to the heavy.

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The colts bred are sold to the dealers from the west country, when year old out; and they are there trained for the draught or the carriage. The fillies are generally sold to the English dealers, and but a few of them are kept for breeding. The land in Annandale is tilled with horses, and all carriage is performed by them. Some particular gentlemen farmers have tried to plough and carry on other farm labour with oxen; but it has not succeeded, owing, it is supposed, to the difficulty of getting servants acquainted with the proper management, and to lime and coals, and corn markets, being generally a long carriage. These inconveniences, however, might probably be well got over, if the practical and operating farmers were to make the trial. If they did so, there can scarce be a doubt but they would find the advantage by it, besides its adding to the sale or produce of the country; but there is reason to fear this will not come about, while the farmers have generally so great a passion for buying and selling horses. It is true, that many of them get their labour wrought with little out-lay of money, and some even put money in pocket between the buying and selling: but they do not consider their loss of time in marketing; and the idle space and extraordinary feeding they bestow in fitting them up for sale.

If the state of farming and management practised in particular farms in different parts of Annandale, but more generally in the lower classes of parishes, by a regular division of their farms, fallowing with green crops, and sowing grass-seeds with barley, were general, it would seem to be the most desirable that is attainable; and it is perhaps the greatest degree of perfection yet known, of which this district of country is capable. It appears to be suited to the situation, the soil and climate. Far, however, the greater part of the land already in cultivation is yet in the old state of management. But it is believed the ideas of the advantages arising from the inclosing and improvement of farms has taken such root, that there is little doubt it will make progress. Without the attention and aid of proprietors it will be slow, and many years lost of the benefit that would accrue to themselves, their tenants, and to the State. To bring such advantages to an earlier maturity, the attention and encouragement of those nearly interested is indispensable; and perhaps nothing else that has ever been the pursuit of man can be more laudable in individuals and public societies to promote, or more the duty of the legislative body of the nation to encourage, by the laws.

In the improvement of land, the proprietor and tenant must go hand in hand. The tenant must be shown that advantages will arise from it, and that by his attention and industry a share, and the first share, will come to himself. When a farm is to be inclosed, and brought from the old management to a regular state of cultivation, the tenant must have a lease something beyond the common use of the country. Without this, if the rent be adequate at the time, he will not be paid for the extraordinary out-lay or labour, and the exertion necessary at the beginning, and he will have no inducement to preserve and nourish young fences. The expense of houseing and inclosing fall naturally to the proprietor, because the uses of them ought to remain after the tenant's right is at an end. But if the tenant be not interested in making these efficient, and keeping them in a good state, the satisfaction or advantages of the proprietor will be but small.

When farms are to be laid out for inclosing and cultivation, it will be well to consider the state of the country with respect to the property of the farmers. If the gene-

